SONY

3-754-061-23(1)

FM Stereo/FM-AM Receiver

Operating Instructions

STR-D3070X
STR-D2070X

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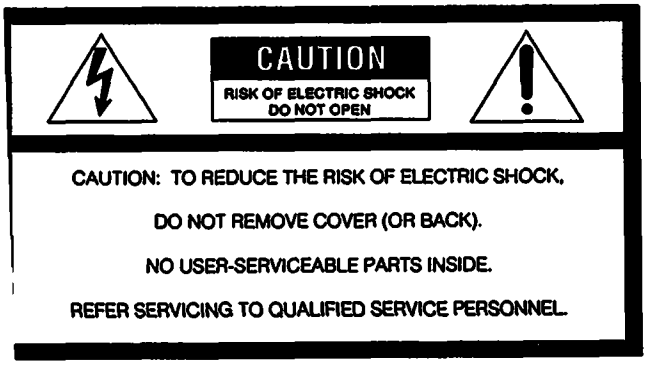
Warning

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol in intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Owner's Record

The model number is located on the rear exterior and serial number is on the rear. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No._____ Serial No._____

Note to CATV system installer

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

INFORMATION

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna
Relocate the equipment with respect to the receiver
Move the equipment away from the receiver
Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

For the customers in Canada

CAUTION :
TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS POLARIZED AC PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

This apparatus complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations.

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Introduction
Overview

The STR-D3070X/D2070X is an FM Stereo/FM-AM receiver and audio/video control center.
You can enjoy various audio/video program sources with this unit.

TV/video programs
- You can enjoy TV or CATV programs with FM simulcast.
- Sounds from various audio program sources can be added on video tapes during editing.

Tuner
- Precise tuning is ensured by a quartz lock digital synthesizer.
- Station Index system allows you to tune into a station quickly.

Front panel
- The buttons and switches on the front panel are placed practically so that you can operate this receiver easily.

Digital surround processor
- The STR-D3070X/D2070X electronically reproduces the reflected sound (early reflection) and reverberation sound (reverberation) by using its digital signal processor, and allows you to obtain the acoustics of various situations.
- DOLBY SURROUND PRO LOGIC *decoder reproduces the specially encoded surround sound of Dolby surround video programs.

* Manufactured under license from Dolby Laboratories Licensing Corporation. Additionally licensed under one or more of the following patents: U.S. numbers 3,632,886, 3,746,792, and 3,959,590. Canadian numbers 1,004,603 and 1,037,877. "DOLBY" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Digital parametric equalizer
- You can enjoy audio program sources with appropriate equalization curve by controlling the level of the desired 3 frequency bands.

Digital Dynamic Sound (DDS)
- you can use the compressor or expander to control the dynamics:
  — the compressor compresses the dynamic range of the program source, so you can enjoy dynamic sound at small output levels.
  — the expander eliminates undesired noise.

Sound field
- 10 recommended sound field programs (combination of surround, parametric equalizer, and digital dynamic sound settings) are preset in the factory for easy use. You can also store up to 10 settings you created in the memory.
- Combined use of the sound field programs and the preset stations allow you to enjoy broadcast listening immediately with the memorized sound field settings.

ON SCREEN function (STR-D3070X only)
- This function allows you to monitor the operation being performed on the monitor TV.

TITLE function (STR-D3070X only)
- With this function, you can edit a title and superimpose on your picture.

Dual room link control (DRLC)
- With the optionally available Dual Room Link control kit RM-2070K, you can obtain the DRLC function which links a second room to your main or primary listening room. You can enjoy listening to either the same program source being played in the main room or a different program source in the second room.

Programmable system commander RM-P311
- The supplied remote commander can "learn" the various functions of other remote commanders of the infrared type.

Precautions

On safety
- Operate the unit only on 120 V AC, 60 Hz.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by grasping the plug. Never pull the cord itself.
- One blade of the plug is wider than the other for the purpose of safety and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.

On operation
Before making program source connections, be sure to turn the power switch off and unplug the unit.

On cleaning the cabinet
Clean the cabinet, panel and controls with a soft cloth lightly moistened with mild detergent solution. Do not use any type of abrasive pad, scouring powder, or solvent such as alcohol or benzine.

For the customers in the U.S.A.
For detailed safety precautions, see the "IMPORTANT SAFEGUARDS" leaflet.

If you have any question or problem concerning your unit, please consult your nearest Sony dealer.

Unpacking

Choosing a Good Location

To prevent internal heat buildup in the unit,
place the unit in a location with adequate air circulation.

Do not install the unit:
- near heat sources such as radiators or air ducts.
- in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.

Do not place anything on top of the cabinet.
The top ventilation holes must be unobstructed for the proper operation of the unit and to prolong the life of its components.

Do not throw away the carton and packing material!
It will be an ideal container when transporting the system for repair work, etc.

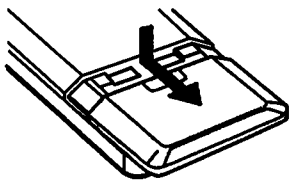
Checking the Supplied Accessories

After unpacking, check that the following accessories are present.
- FM ribbon antenna .....(1)
- External antenna connector .....(1)
- AM loop antenna.....(1)
- Remote commander RM-P311 .....(1)
- Sony batteries SUM-3 (NS) .....(2)

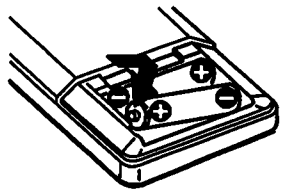
Inserting the Batteries into the Remote Commander

Before operating remote commander, install the batteries as shown.

1 Open the cover.



2 Insert two size AA (R6) batteries with correct polarity.



To avoid damage caused by battery leakage and corrosion
When the commander will not be used for a long time, remove the batteries.

Battery life
Normal operation can be expected about a half year using Sony SUM-3 (NS), and a year using Sony AM-3 (NW) alkaline batteries.
When the batteries are run down, the remote commander will not operate the unit. In this case, replace batteries with new ones.

Selecting the AM Tuning Interval

The AM tuning interval is preset to 10 kHz. To use the receiver where the frequency allocation system is based on a 9 kHz interval, make the following adjustments.

1 Turn on the power and tune in any AM station.
2 Turn off the power.
3 Press the POWER button while pressing the "+" PRESET TUNING button.

To reset the AM tuning interval, repeat the above steps.

Caution
When the interval is changed, all preset stations which you have memorized will be erased. After changing the interval, be sure to preset the stations again.

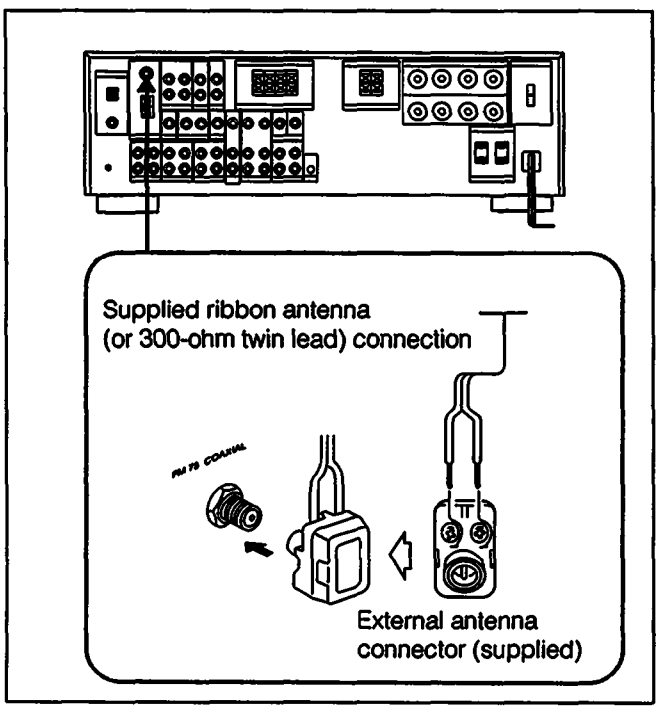
Hooking Up the System

At first, this section describes about the antenna connection and then the connection with the other equipment. After that, it shows about the speaker connection and about the AC outlet.

- Do not connect the power cord to an AC outlet nor press the POWER switch before accomplishing all other connections.
- The cable connectors should be fully inserted into the jacks. Loose connection may cause hum and noise.
- Jacks and plugs of the connecting cord are color-coded as follows:
  Red jacks and plugs: For the right channel of audio signals
  White jacks and plugs: For the left channel of audio signals
  Yellow jacks and plugs: For video signals

Connecting an FM Antenna

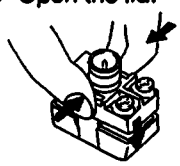
Though the ribbon antenna is supplied with this unit, the higher quality sound will be obtained with the 75-ohm coaxial cable.



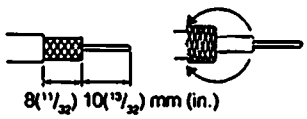
75-ohm coaxial cable connection for higher quality sound
A 75-ohm coaxial cable is free from external interference, reduces noise pick up, and is the ideal transmission line for most FM installations. A 3C-2V cable is recommended. Connect the 75-ohm coaxial to the supplied antenna connector and connect it to the FM antenna connector.

How to use the external antenna connector

① Open the lid.

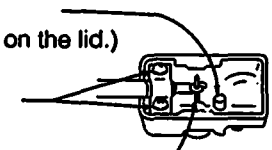


② Strip the cable.

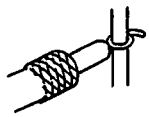


③ Remove the ring.
(Put it on the projection on the lid.)

④ Loosen the screw and insert the cable.



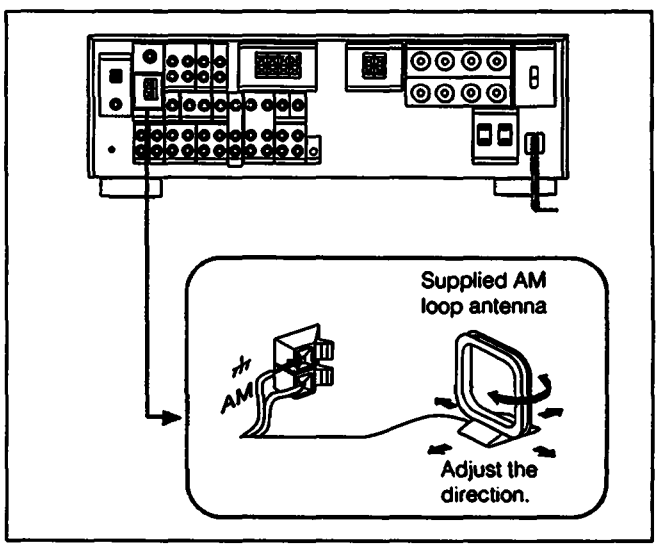
⑤ Coil the center conductor.



⑥ Fasten the screws.
⑦ Snap the lid into place.

Connecting an AM Antenna

The AM broadcast is enough received with the supplied AM loop antenna. However, the connection of insulated wire is also available for areas with difficult AM reception.

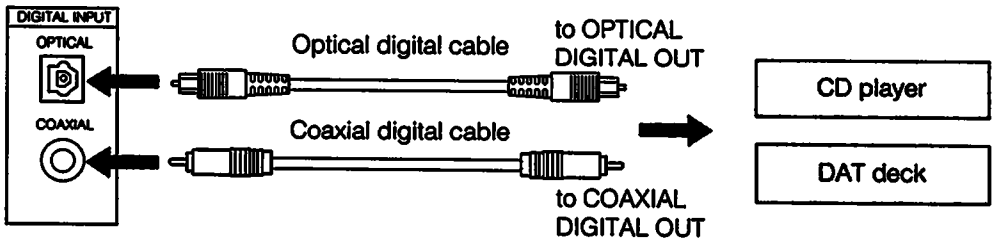


For areas with difficult AM reception
In areas with troubled reception, connect a 6 to 15-meter (20 to 50-foot) insulated wire to the AM antenna terminal. Extend this out of doors if possible, keeping the greater portion horizontal.
(There is no need to disconnect the supplied antenna.)

To prevent hum
Connect the ground wire to ANTENNA ground terminal (⏚).
When an outdoor antenna is installed, be sure to connect the ground wire for lightning protection.

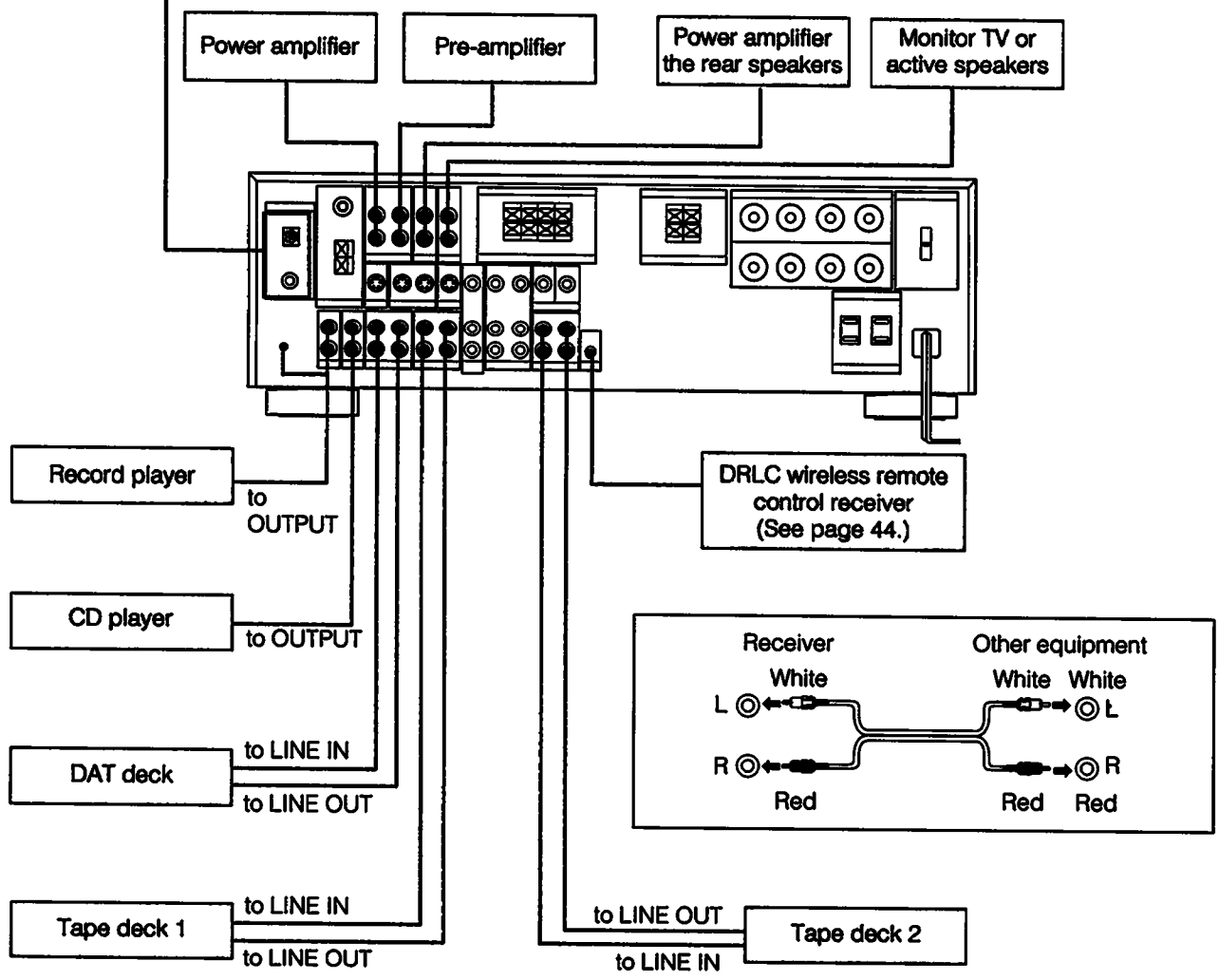
Connecting Audio Equipment

Connecting a CD player or DAT deck equipped with digital outputs



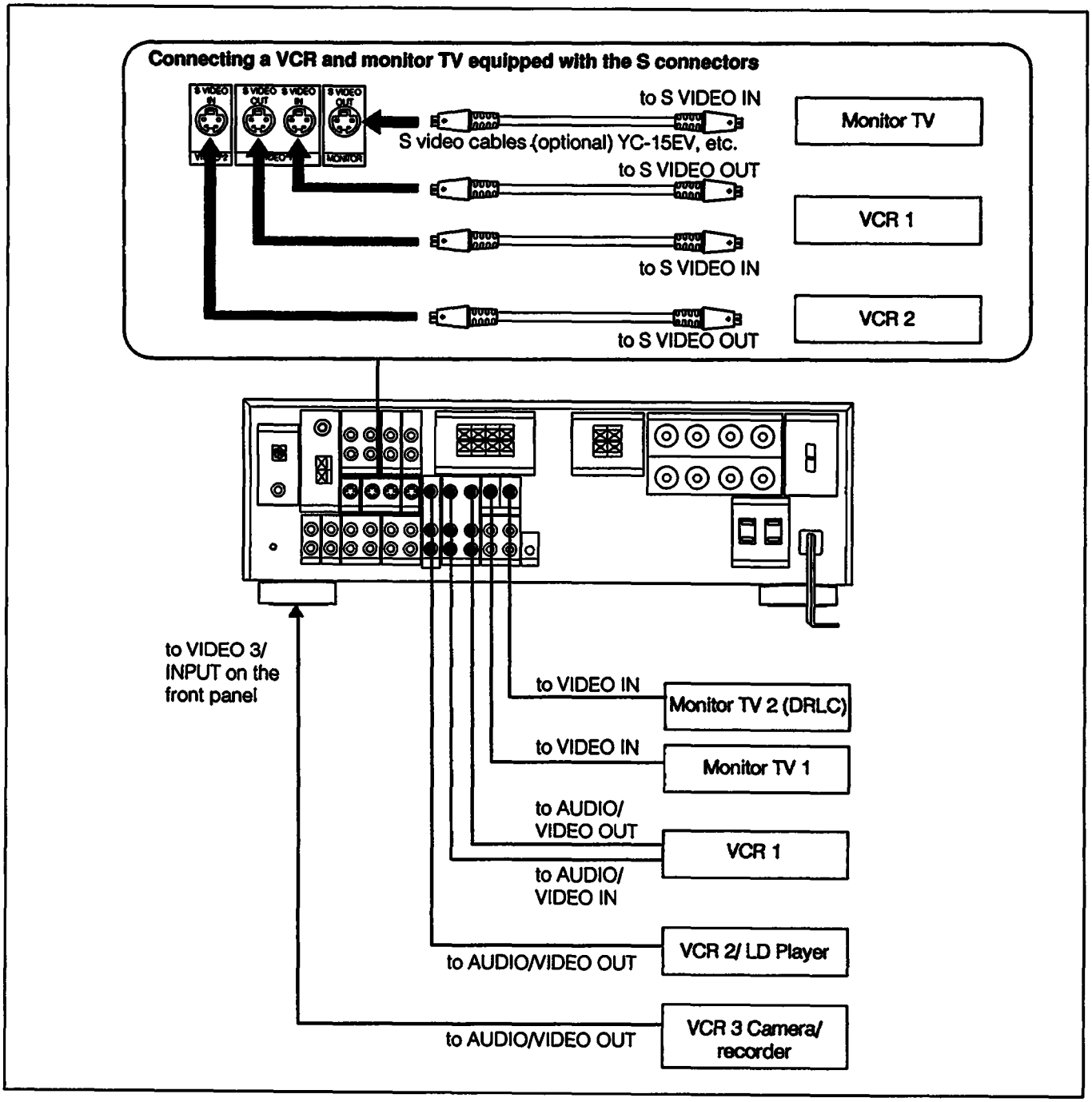
Caution

Do not connect the DAT deck to the REC OUT jacks when it is connected to the DIGITAL INPUT jack. It makes a loop of audio signal and may cause malfunction.



Hooking Up the System

Connecting Video Equipment


Connecting a VCR and monitor TV equipped with the S connectors
to S VIDEO IN
S video cables (optional) YC-15EV, etc.
to S VIDEO OUT
to S VIDEO IN
to S VIDEO OUT
Monitor TV
VCR 1
VCR 2
to VIDEO 3/ INPUT on the front panel
to VIDEO IN
Monitor TV 2 (DRLC)
to VIDEO IN
Monitor TV 1
to AUDIO/ VIDEO OUT
VCR 1
to AUDIO/ VIDEO IN
to AUDIO/VIDEO OUT
VCR 2/ LD Player
to AUDIO/VIDEO OUT
VCR 3 Camera/ recorder

Notes

- The unit has independent input/output circuitries for the S VIDEO and VIDEO IN jacks. Therefore, the video signal input from VIDEO IN does not output for the S VIDEO OUT jacks, and vice versa.
- When the VIDEO 1 S VIDEO IN and VIDEO 2 S VIDEO IN/OUT jacks are connected, use the phono jacks of VIDEO 1 IN and VIDEO 2 IN/OUT for the audio signals.

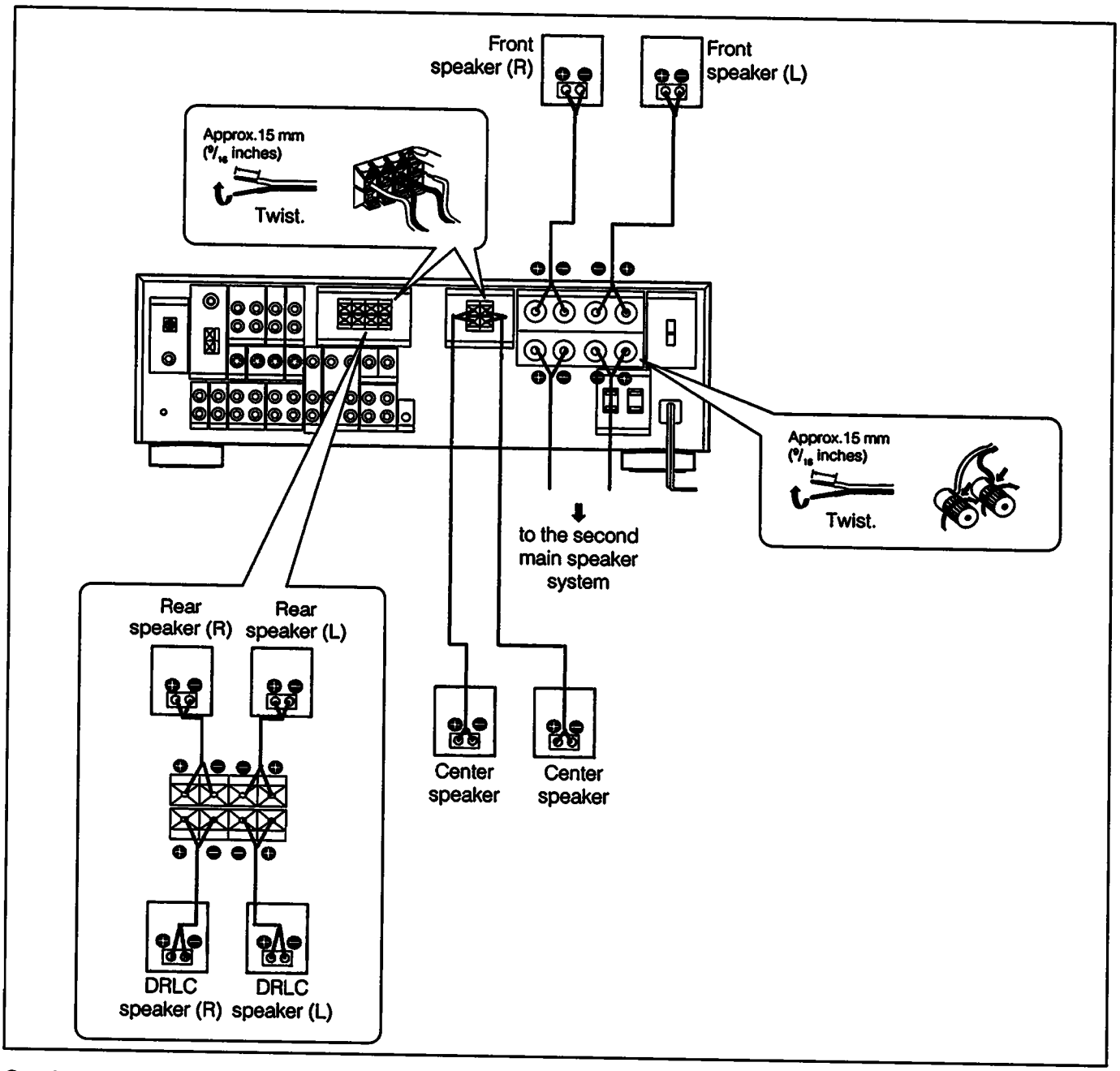
Caution for STR-D3070X

When the MONITOR VIDEO OUT jack is connected and ON SCREEN ON/OFF is set to ON (The ON SCREEN indicator lights up.), the cursor mode operation buttons cannot be used for the other functions than the ON SCREEN function.

When the MONITOR S VIDEO OUT jack is connected, the ON SCREEN function cannot be available.

Connecting Speaker Systems

Front, rear, center speakers and the speakers for the DRLC function can be connected to this unit.



Speaker impedance and power capability
This receiver is designed to work best with speakers having nominal impedance from 8 to 16 ohms. Be sure to use a speaker system with adequate nominal impedance and power handling capabilities.

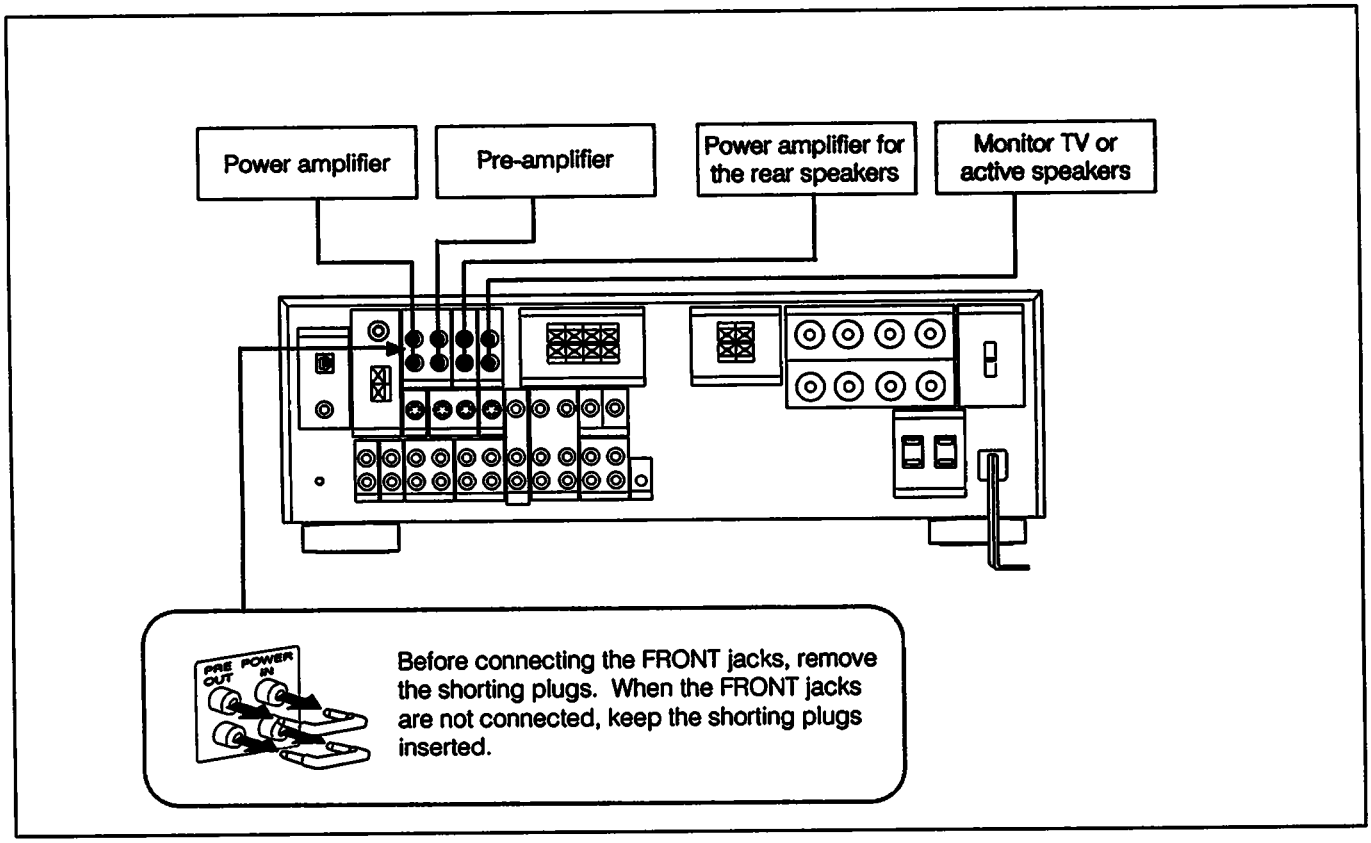
Note

- When connecting the speaker cord to the speaker terminal, make sure that the polarity (+ and –) of the speaker cord is correct. If the polarity is reversed at either speaker, the sound will be distorted and will lack bass.
- When connecting the active speaker incorporated with the power amplifier, connect to the either L or R of CENTER jack.

Hooking Up the System

Connecting the external power amplifier

By connecting the external power amplifier to this receiver, you can obtain a powerful sound.


Power amplifier
Pre-amplifier
Power amplifier for the rear speakers
Monitor TV or active speakers
PRE OUT
POWER IN
Before connecting the FRONT jacks, remove the shorting plugs. When the FRONT jacks are not connected, keep the shorting plugs inserted.

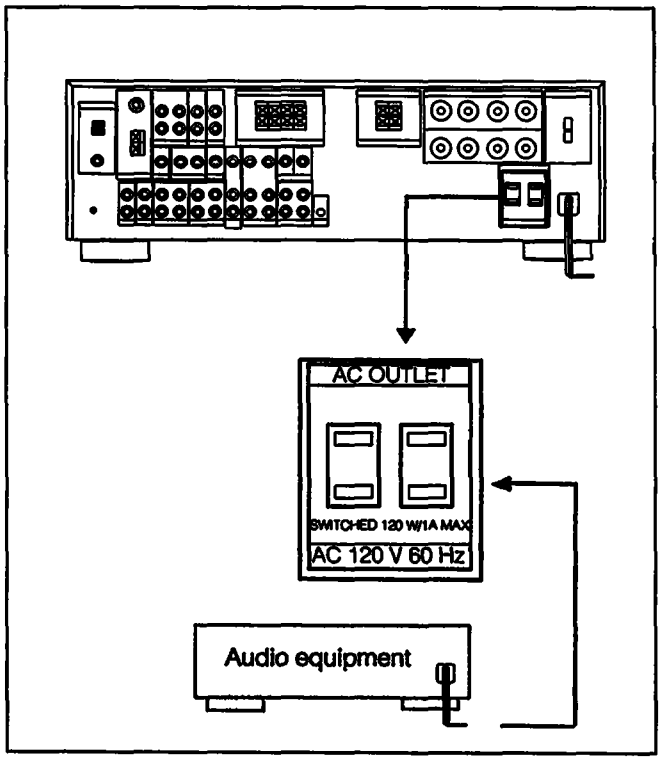
When connecting the amplifiers for the front speakers
Connect the input jacks of the power amplifier to the FRONT PRE OUT jacks of this receiver and the output jacks of the pre-amplifier to the FRONT POWER IN jacks of this receiver. The powerful sound of the front speakers will be available.

When connecting a power amplifier for the rear speakers
Connect the input jacks of the power amplifier to the REAR jacks of this receiver.

When connecting a monitor TV or an active speaker as a center speaker
Connect the input jack of the monitor TV or an active speaker to either L or R of the CENTER jacks of this receiver.

Connecting to the Power Outlet

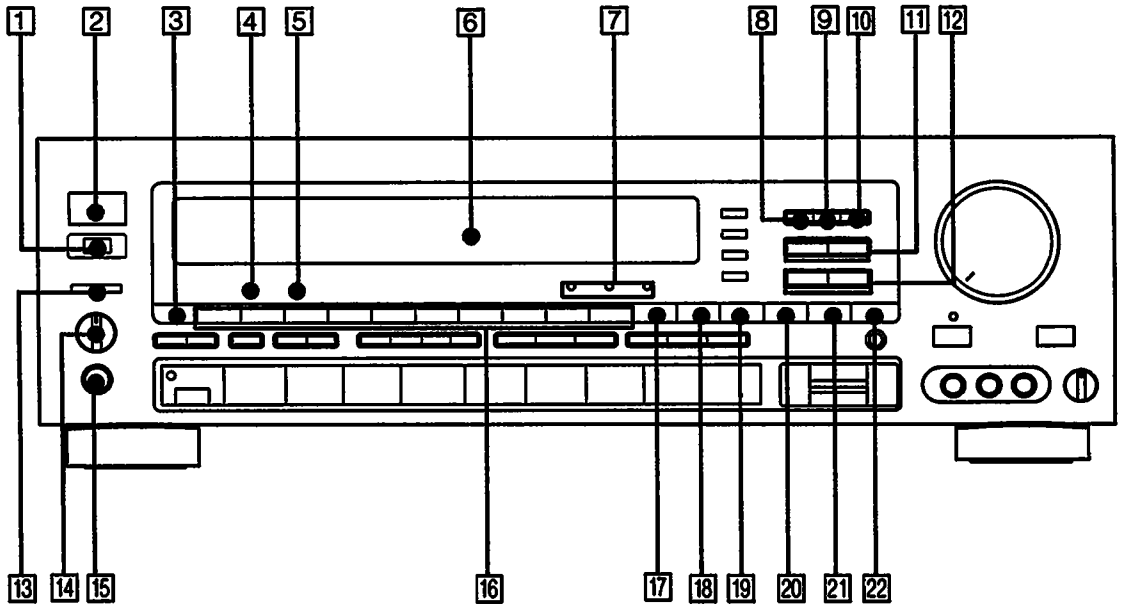
By connecting the power cord of the other audio equipment to SWITCHED AC OUTLET, this unit can supply the power source to the other audio equipment.

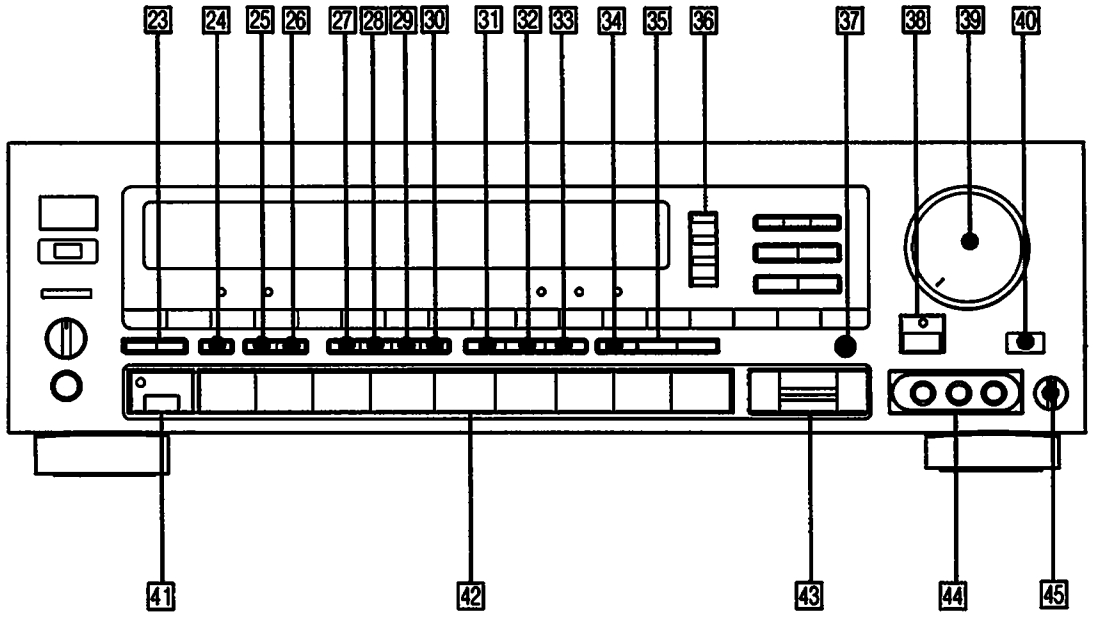


Caution
Be careful that the total power consumption of each equipment connected to the outlets on the receiver does not exceed 120 watts.
Do not connect electrical home appliances such as an electric iron, fan, TV, or other high-wattage equipment to these outlets.

Parts Identification

Front Panel





[1] **Remote sensor**

[2] **POWER switch**

[3] **SHIFT button** (See pages 24, 25, 26.)

[4] **ON SCREEN indicator (STR-D3070X only)** (See page 19.)

[5] **TITLE ON indicator (STR-D3070X only)** (See page 42.)

[6] **Display window**

[7] **SAMPLING FREQUENCY indicators**

[8] **TUNING DIRECT button** (See page 22.)

[9] **TUNING LEVEL button** (See page 23.)

[10] **DISPLAY FREQ/INDEX button** (See pages 23, 26, 27.)

[11] **INDEX SELECT/TUNING –/+ buttons** (See pages 23, 27.)

[12] **PRESET TUNING –/+ buttons** (See pages 25, 27.)

[13] **DRLC/POWER switch** (See page 44.)

[14] **SPEAKERS selector** (See page 19.)

[15] **HEADPHONES jack**

[16] **Numeric buttons** (See pages 22, 24, 25, 26, 27, 28, 33, 40, 41.)

[17] **MEMORY button** (See pages 21, 24, 26, 40, 41.)

[18] **FM MODE button** (See pages 22, 24.)

[19] **FM/AM button** (See pages 22, 23.)

[20] **SOUND FIELD RECALL button** (See pages 28, 40.)

[21] **PRESET SF LINK PGM button** (See page 41.)

[22] **PRESET SF LINK ON/OFF button** (See page 41.)

[23] **EDIT VIDEO/AUDIO buttons** (See pages 30, 31.)

[24] **ON SCREEN ON/OFF button (STR-D3070X only)** (See pages 8,19.)

[25] **TITLE ON/OFF button (STR-D3070X only)** (See page 42.)

[26] **TITLE IN/OUT button (STR-D3070X only)** (See page 42.)

[27] **EQUALIZER ON/OFF button** (See page 38.)

[28] **EQUALIZER BAND button** (See page 38.)

[29] **EQUALIZER SLOPE button** (See page 38.)

[30] **DISPLAY RTA (Real Time Analyzer) button** (See page 38.)

[31] **SURROUND ON/OFF button** (See pages 17, 18, 39.)

[32] **SURROUND MODE button** (See pages 17, 18.)

[33] **SURROUND PRO LOGIC mode button** (See pages 16, 17.)

[34] **SOUND FIELD USER/PRESET button** (See pages 28, 40.)

[35] **SOUND FIELD –/+ buttons** (See pages 28, 33, 40, 41.)

[36] **CURSOR MODE indicators** (See pages 17,18, 21, 26, 35, 38.)

[37] **CURSOR MODE/TITLE MENU (STR-D3070X only) button** (See pages 17,18, 21, 26, 35, 38, 39.)

[38] **MUTING button and indicator** (See page 19.)

[39] **VOLUME control** (See page 19.)

[40] **DDS (Digital Dynamic Sound) button** (See page 39.)

[41] **TAPE 2 MONITOR button and indicator** (See page 29.)

[42] **Function selectors**

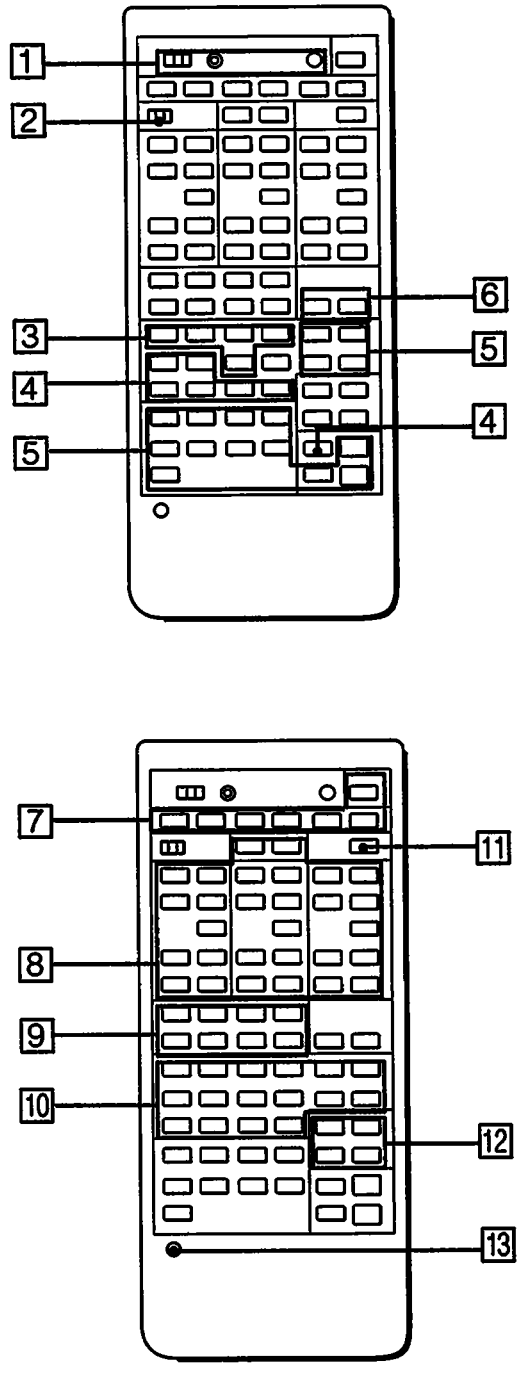
[43] **Cursor mode operation buttons** (See pages 17, 18, 21, 35, 38, 39, 42.)

[44] **VIDEO 3/INPUT jacks** (See page 8.)

[45] **BALANCE control** (See page 19.)

Parts Identification

Remote Commander



1 Program control block

Mode selector and indicator (page 46)
SONY STD: To control Sony equipment.
USER STD: To control equipment whose remote control functions are stored.
LEARN: To store functions of other remote commanders emitting infrared rays.
PROGRAM CLEAR button: Clears the stored functions.

2 MODE selector

1: To select the functions indicated in light gray such as DECK, DAT, CD player and CURSOR/SURROUND mode of the receiver.
2: To select the functions indicated in blue such as VTR, LDP (Laser disc player) and TV.

3 Cursor control block

CURSOR MODE button: Selects cursor mode.
CURSOR operation buttons

4 Sound control block

S.(sound) FIELD buttons
MODE: Selects sound field mode.
USER/PRESET button: Selects the USER or PRESET mode.
SURROUND buttons
ON/OFF: Turns on/off the surround mode.
MODE: Selects the surround mode.
T. (test) TONE: Generates a pink noise signal that is sent in succession to each speaker.
EQ (equalizer) ON/OFF button: Turns on/off the equalizer.
DDS/DBFB button: Turns on/off the DDS (Digital Dynamic Sound). (The DBFB function is not available with this receiver.)

5 Amplifier block

FUNCTION selectors: Select an input source of the receiver.
REAR VOL +/– buttons: Control the volume of rear speakers (surround level).
MUTING button: Mutes the sound.
MASTER VOL +/– buttons: Control the receiver volume.
CENTER VOL +/– buttons : Control the volume of center speaker (surround level).

6 ON SCREEN block (STR-D3070X only)

ON SCREEN ON/OFF button: Turn on/off the ON SCREEN mode.
TITLER ON/OFF button: Turn on/off the TITLER mode.

7 Power control block for other equipment

SYSTEM OFF button: Turns off the power of the whole system: LDP, VTR, TV and AUDIO.
LDP/VTR/TV/AUDIO POWER buttons: Control the power of each unit.

8 TAPE/DAT/VTR control block

REC MODE REV/FWD buttons:
For reverse recording, press REV and ● together.
For forward recording, press FWD and ● together.
VTR 1: Betamax VCRs
VTR 2: 8mm VCRs
VTR 3: VHS VCRs
Set to the VTR 1, 2 or 3 according to your VCR setting.
ANT TV/VTR button: Selects the output signal from the antenna terminal on the VCR, either a TV signal or VCR programs.
VTR CH +/– buttons: Select channel on the VCR.
◀◀/▶▶: fast winding
●: Recording (Press ● and FWD at the same time.)
◀/▶: Play
■: Stop
❚❚: Pause

9 CDP/LDP control block

◀◀/▶▶: Manual search
I◀◀/▶▶I: Locates a desired selection
D (disc) SKIP: Disc skip (for a CD player equipped with a multi-disc changer)
▶: Play
■: Stops play.
❚❚: Pause

10 TV control block

Program number (1 to 0) and ENTER buttons: Select the channel.
TV/VIDEO selector: Selects the program to see : TV or VIDEO.
TV VOL +/– buttons: Control the TV volume.
TV CH +/– buttons: Select a preset channel.

11 SLEEP button

Set to the SLEEP timer mode. In this mode, the unit is automatically turned off after the designated time. (page 20)

12 Tuner block

INDEX SEL (select) button: Select an indexed preset station.
SHIFT and PRESET +/– buttons: Select a preset station.

13 RESET button

Reset the commander to the initial state. If the remote commander does not function correctly after replacing the batteries with new ones, press this button.

Note:
When the ◀/▶ (play) buttons in 8 and the SHIFT button and PRESET +/– buttons in 12 is pressed, the unit enters the corresponding function mode without pressing the FUNCTION buttons in 5, if the CD player is connected to the CD jacks, the tape deck to the TAPE jacks and the video deck to the VIDEO 1 jacks (switch the DECK/VCR selector on the remote commander to VTR 1).

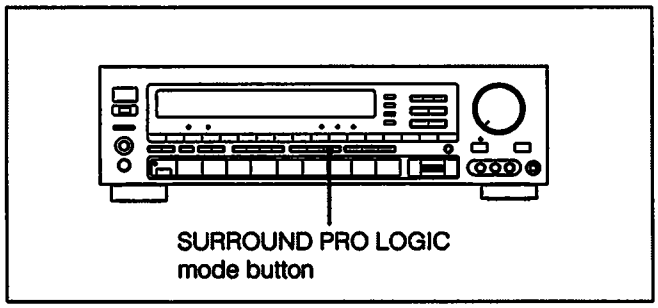
Getting Ready for Dolby Surround Sound

This section describes about selecting the speaker configuration and then adjusting the speaker volume and the delay time of the rear speakers so that you can enjoy the Dolby surround sound.

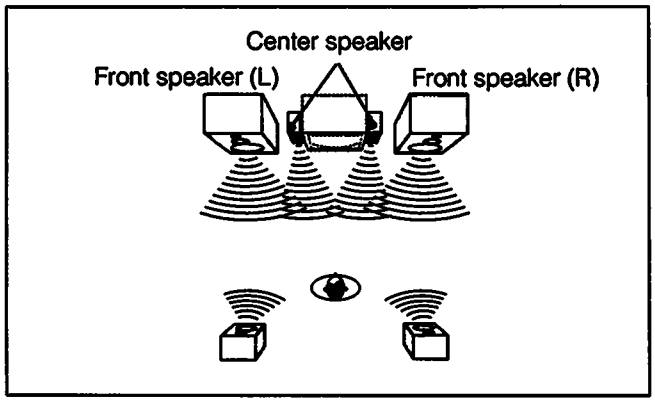
Placement of Speakers and Selecting the PRO LOGIC MODE

The Dolby Pro Logic Surround Decoder has the same functions for playback, such as movie theaters and gives a theater-like experience in your listening room, naturally reproducing the audio sound field.

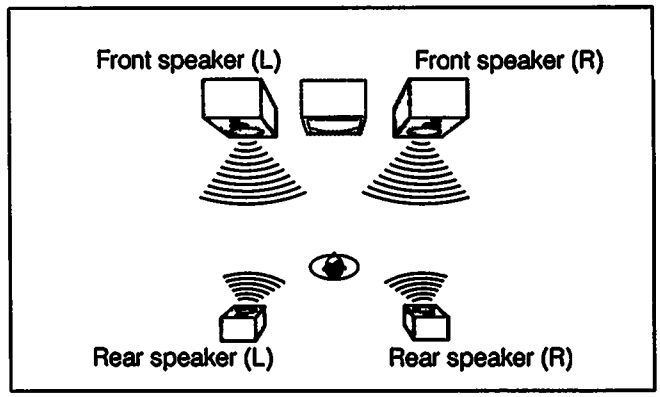
The STR-D3070X/D2070X incorporates a decoder which reproduces the specially encoded surround sound of Dolby surround video programs.
In the Dolby surround mode, select the speaker operation mode according to your speaker configuration by pressing the SURROUND PRO LOGIC mode button. Each time the SURROUND PRO LOGIC mode button is pressed, the SURROUND PRO LOGIC mode is changed in the following order: NORMAL → WIDE → PHANTOM → 3 CH. LOGIC



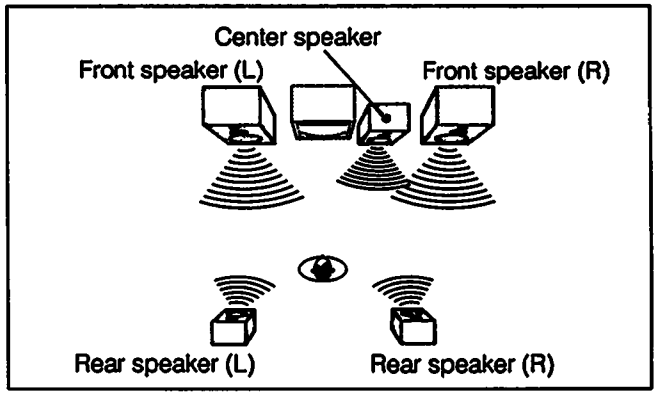
NORMAL mode
Select this mode if you use a small center speaker. The bass sound of the center channel is output from the front speakers, as a small speaker cannot produce enough bass.



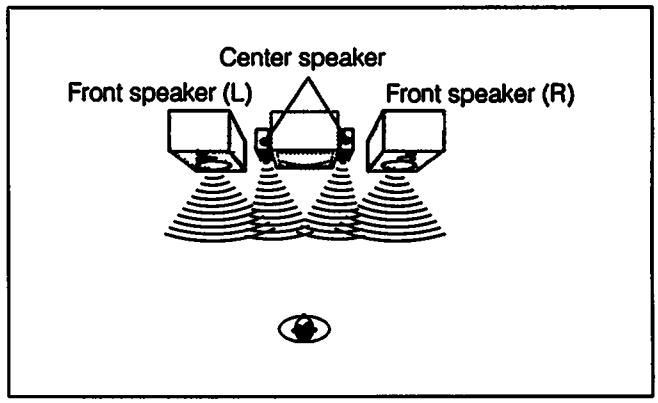
PHANTOM mode
Select this mode when you play back a Dolby surround program source without using a center speaker. The sound of the center channel is output from the front (L and R) speakers.



WIDE mode
Select this mode if you use a medium to big center speaker.



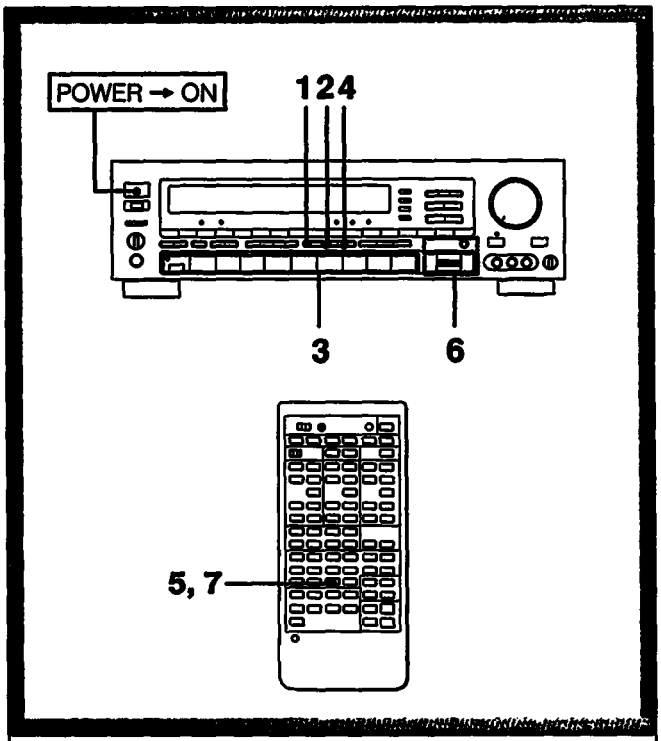
3CH. (Channel) LOGIC mode
Select this mode when you play back a Dolby surround program source only with the front and center speakers. The sound of the rear channel is output from the front (L and R) speakers.



Even for video software which does not carry the DOLBY STEREO or DOLBY SURROUND mark
Some commercially available software may have Dolby surround processed sound tracks even though it is not so indicated on the package.

Adjusting the Speaker Volume

To enjoy the surround sound to the maximum on playing any program sources, adjust the front, rear, and center (if connected) speakers to the same volume level. The adjustment must be done with a test tone in the DOLBY SURROUND mode, but the level once adjusted can be used for all surround modes.
You can adjust the volume level from your listening position by using the remote commander.



1 Press SURROUND ON/OFF to ON.
SURROUND ON appears on the display.

2 Press SURROUND MODE.
DOLBY SURR appears on the display.

3 Select a program source with the function selector and start playback.

4 Select the Dolby pro logic mode with the SURROUND PRO LOGIC mode button according to your speaker system.

5 Press T. TONE on the remote commander to set to on.

6 Press CURSOR MODE.
The SURR (surround) indicator lights up.
To adjust the level of rear speakers
Press △ or ▽ to select the rear level mode and then adjust the level with ◁ or ▷ or REAR VOL +/– on the remote commander.

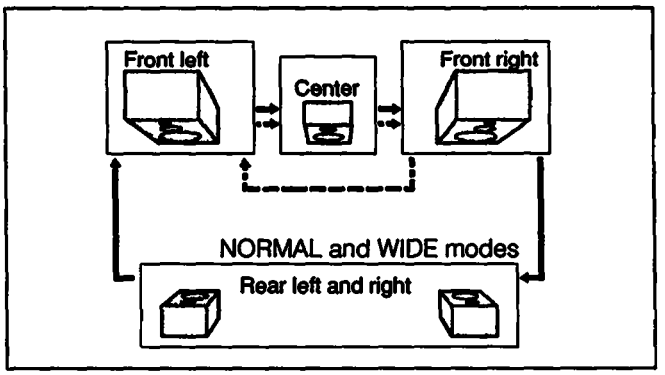
To adjust the level of center speakers
Press △ or ▽ to select the center level mode and then adjust the level with ◁ or ▷ or CENTER VOL +/– on the remote commander so that sound from each speaker is heard in the same volume level at the listening position. (When adjusting the VOLUME control on the receiver, all speakers are adjusted simultaneously.)

7 Press T. TONE on the remote commander to set to off.

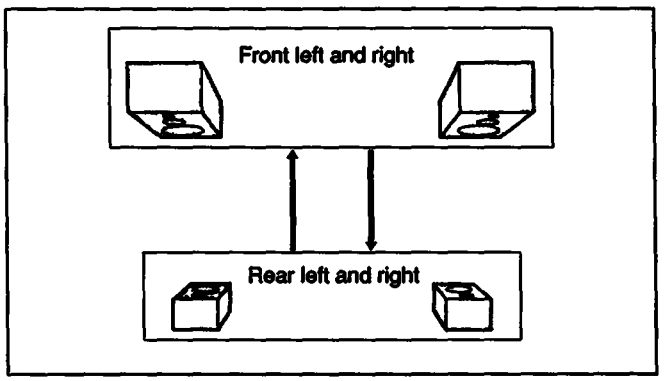
To adjust the level with a test tone signal
Press the T (Test) TONE button on the remote commander after step 4. A test tone (pink noise) signal is sent in succession to each speaker. Adjust the level of rear speaker with ◁ or ▷ or REAR VOL +/– on the remote commander and the level of center speaker with △ or ▽ or CENTER VOL +/– on the remote commander.

To stop the test tone signal
Press the T TONE button again.

Sequence of the test tone
In a system with a center speaker:
The test tone will be output automatically from the front L, center, front R, and the rear speakers in succession.



In a system without a center speaker:
The test tone will be output automatically from the front speakers and rear speakers alternately.

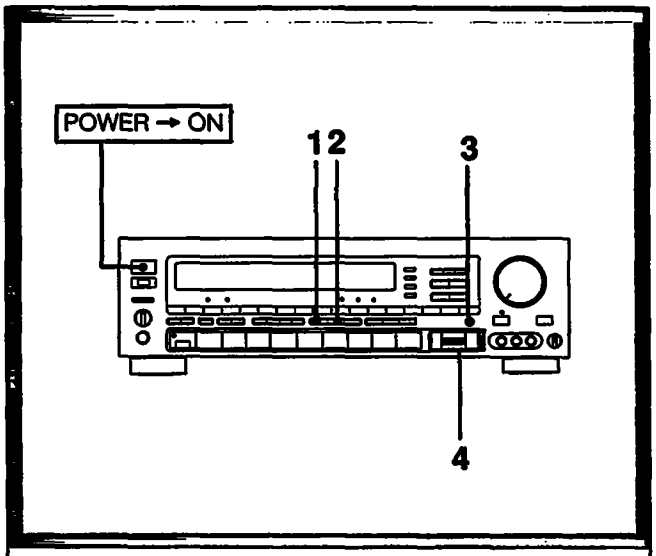


Adjusting Surround Sound

Adjusting the Delay Time of the Rear Speakers

— for Dolby surround mode

The delay time is a time between the surround sound from the front and that from rear speakers. The delay time is adjustable from 15.0 ms to 30.0 ms.



1 **Press SURROUND ON/OFF to ON.**
SURROUND ON appears on the display.

2 **Press SURROUND MODE until DOLBY SURR appears on the display.**

3 **Press CURSOR MODE.**
The SURR (surround) indicator lights up.

4 **Press △ or ▽ to select the delay time mode and adjust the delay time with ◁ or ▷.**

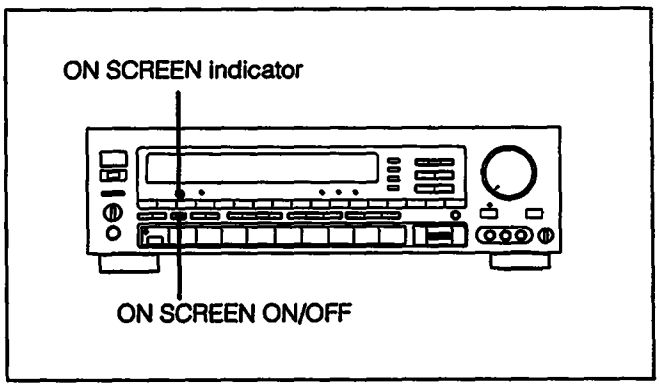
To turn off the surround effect
Press SURROUND ON/OFF again.
The normal sound without surround effect will resume.

Both level and delay time of the surround is memorized each time after adjusting with the cursor operation buttons. They will be restored when the surround mode is resumed.

Note
The delay time for the rear speakers can be adjusted even in the 3 CH.LOGIC mode.

The On-Screen-Display of the STR-D3070X

The STR-D3070X has the on-screen-display function. When ON SCREEN of this receiver is set to on (the ON SCREEN indicator lights up), the information concerning with the operation you will perform appears on TV monitor screen connected to the receiver.



The on-screen-display function is available in the following modes:

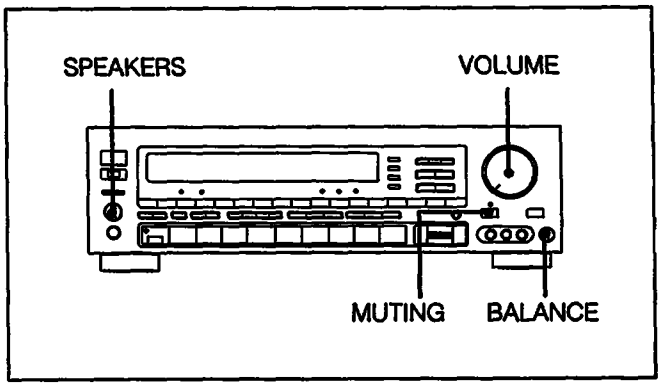
— Opening screen
— Selecting a function
— Tuner operation
— Sound field function
— Equalizer function
— Digital dynamic sound (DDS) function
— Parameter adjustment of the surround effect

When the each operation is finished, the screen returns to the opening screen.

To stop the on-screen-display function
Press ON SCREEN. The ON SCREEN indicator goes off.

Chapter 2 Basic Operations
Adjusting Basic Audio Controls

You can enjoy superb sounds using the audio adjustment functions as shown below.



Adjusting Volume

To adjust volume
Turn VOLUME.

To reduce the sound to a low level temporarily (– 20 dB attenuation)
Press MUTING. The indicator lights up.
Press again to restore the same listening level as before.

Adjusting Left and Right Sound Balance

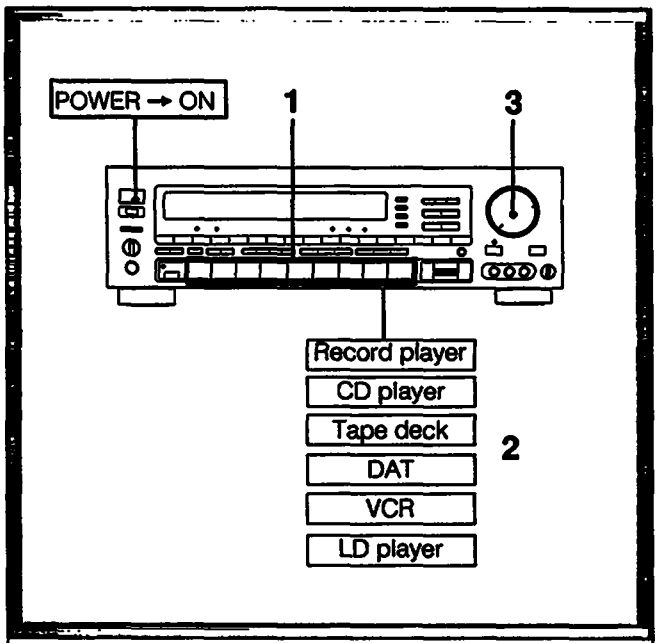
Adjust BALANCE to correct stereo imaging, when the speaker position is not symmetrical.

Selecting the Speaker System

To drive speaker system A: Set SPEAKERS to A.
To drive speaker system B: Set SPEAKERS to B.
To drive both speaker systems A and B (series connection): Set SPEAKERS to A + B.
For headphone listening: Connect headphones to HEADPHONES and set SPEAKERS to OFF.

IMPORTANT
Speaker systems A and B are series connected. When only one speaker system is connected,no sound can be heard at the A + B position.

Selecting a Program Source



1 Select the progam source.

	Function selector to be pressed
Phono record	PHONO
Radio Broadcast	TUNER
Compact disc	CD
DAT program	DAT
Taped program	TAPE 1, TAPE 2 MONITOR
Video program	VIDEO 1, VIDEO 2/LD, VIDEO 3

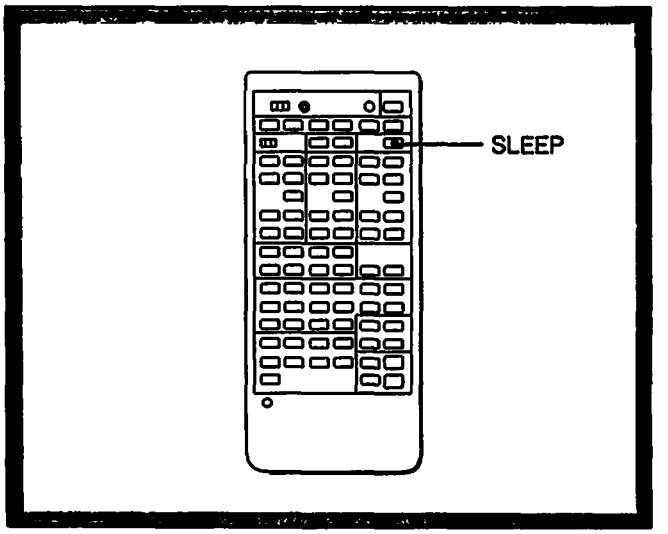
When a function selector is pressed, the indicator of the function you have selected appears on the display.

2 Start playback of the selected program.

3 Adjust the volume.

To Turn Off the Power at the Desired Time (The Sleep Timer Function)

This receiver has the sleep timer function. With this function, you can turn off the power automatically at the desired time by designating the turn-off time.
Press SLEEP on the remote commander when the power is on. Each time SLEEP is pressed, the designating time is displayed in the following order: 2 hours → 1 hour and half minutes → 1 hour → 30 minutes → SLEEP OFF



To change the turn-off time

1 Press SLEEP and the remaining time is displayed.
2 Press △ or ▽ to change the sleep time. The sleep time is changed by 1 minute. It can be changed up to 9 hours and 59 minutes (and 59 seconds).

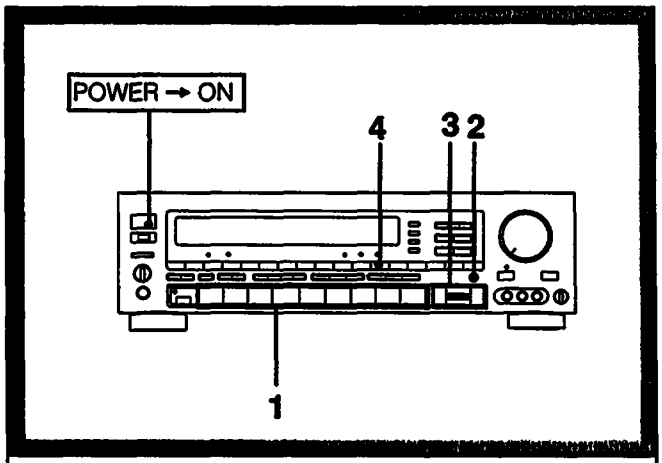
To check the remaining time of the sleep timer

Press SLEEP. The remaining time is displayed.

Selecting a Program Source

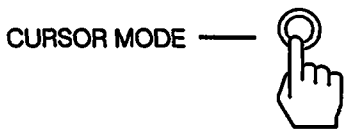
Labeling the Program Source

You can input program sources under index names you create (up to 11 characters); for example, PHONO, TUNER, CD etc.



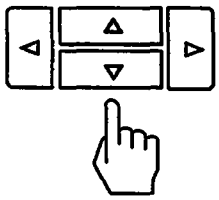
1 Select the program source.

2 Press CURSOR MODE.



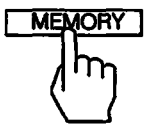
The INDEX indicator lights up.

3 Create an index name.



To select a letter or number, press △ or ▽.
To change the position, press ◁ or ▷.

4 Press MEMORY.



The MEMORY indicator appears on the display and goes off when the memory is finished.

5 Repeat steps 1 to 4 for all other program sources you want to assign an index name to.

If you input an already stored source under any other index name

Only the last selected source will be valid. Each program source can be stored under only one index name.

To return to the initial state

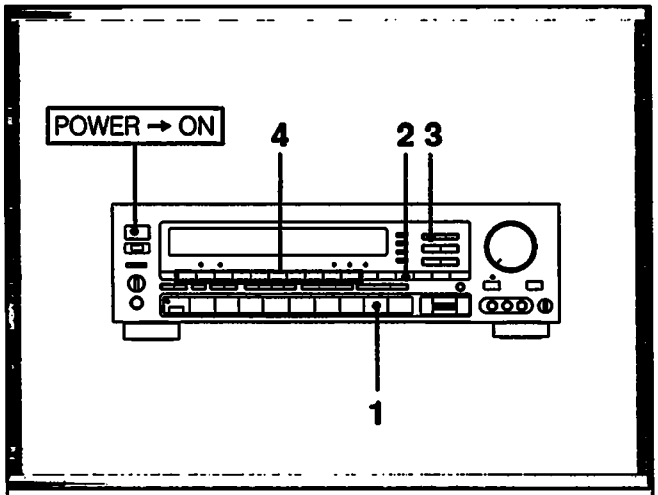
1 Select the program source you want to reset.
2 Press CURSOR MODE to set to the INDEX mode.
3 Select the program source you want to reset again.
4 Press MEMORY.

Usable letters and symbols

!→#+%&'( )*+,-./0123456789:;<=>?↑ABCDE
FGHIJKLMNOPQRSTUVWXYZ[\]II_↓abcdefghijklm
nopqrstuvwxyz

Receiving Broadcasts

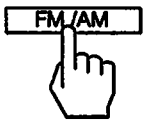
Tuning in a Station Directly (Direct Tuning)



1 Press TUNER.

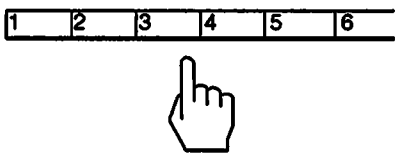
TUNER appears on the display.

2 Select FM or AM.



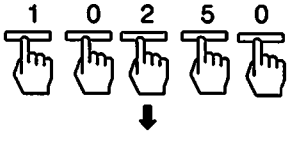
3 Press TUNING DIRECT.

4 Enter the frequency.

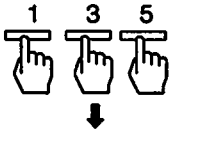


The entered frequency is displayed.

Example 1: FM 102.50 MHz



Example 2: AM 1350 kHz



To correct the entered frequency
Repeat steps 3 to 4.

For entering AM frequencies
You need not enter the last "0".
However, if you have changed the AM tuning interval to 9 kHz, enter all the digits.

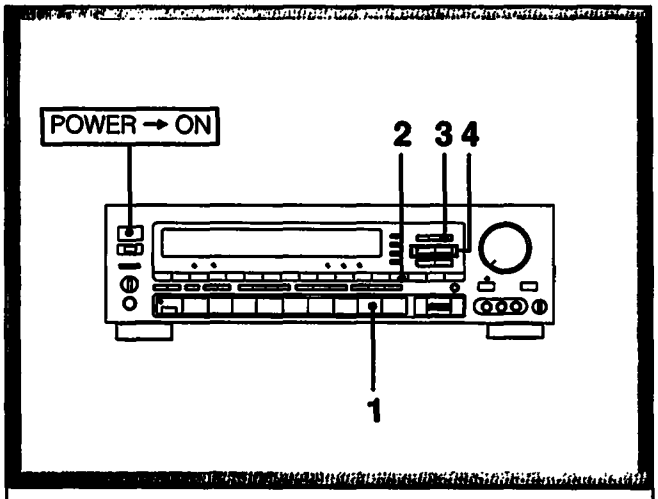
If you enter a frequency not covered by the tuning interval
The entered value is automatically rounded up or down to the closest value covered by the tuning interval.
Tuning intervals for direct tuning are the followings:
FM: 50 kHz interval
AM: 10 kHz interval (changeable to the 9 kHz interval) (See page 5)

When the entered frequency does not exist in the receivable frequency range
The entered digits (up to 5 digits for FM or up to 3 digits for AM) blink in the frequency display area, and reception does not take place.
If this occurs, press TUNING DIRECT again, and enter the correct frequency (the frequency range of the receiver is 87.50 to 108.0 MHz for FM, and 530 to 1710 kHz for AM).

When an FM stereo program is noisy
When the unit receives an FM stereo program, the STEREO indicator lights in the display window. If the stereo program is noisy, press FM MODE to change the mode over the MONO. This eliminates the stereo effect, but the noise will be greatly reduced.
To return to the stereo mode, press FM MODE again.

Scanning Stations Automatically (Auto Tuning)

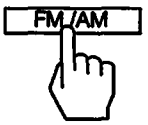
When you do not know the frequency of the station to be received, proceed as follows.



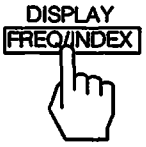
1 Press TUNER.

TUNER appears on the display.

2 Select FM or AM.

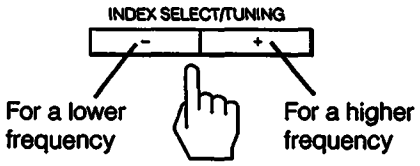


3 Press DISPLAY FREQ/INDEX to set to the FREQ mode.



The frequency appears on the display.

4 Press INDEX SELECT/TUNING – or +.



When a station is received, automatic tuning stops.

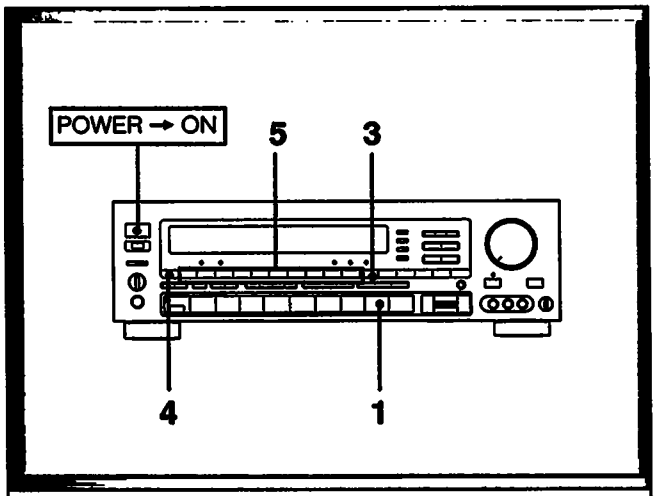
5 Repeat step 4 until the desired station is received.

If the automatic scan stops frequently (for FM reception only)
You can receive only the strong stations by pressing TUNING LEVEL. HIGH appears on the display.

To receive all receivable stations again
Press TUNING LEVEL so that HIGH goes off.

Presetting Stations (Station Preset)

A total of 30 FM/AM stations can be memorized in any desired sequence.

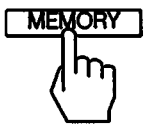


1 Press TUNER.

TUNER appears on the display.

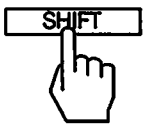
2 Tune in the desired station.
(See "Auto Tuning" or "Direct Tuning".)

3 Press MEMORY.



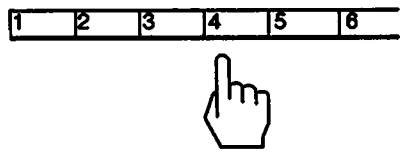
MEMORY appears on the display.

4 While MEMORY appears, select the memory page (A, B or C).



Each time SHIFT is pressed, A, B or C is indicated cyclically.

5 While MEMORY appears, press the desired number.



Repeat above steps for presetting other desired stations.

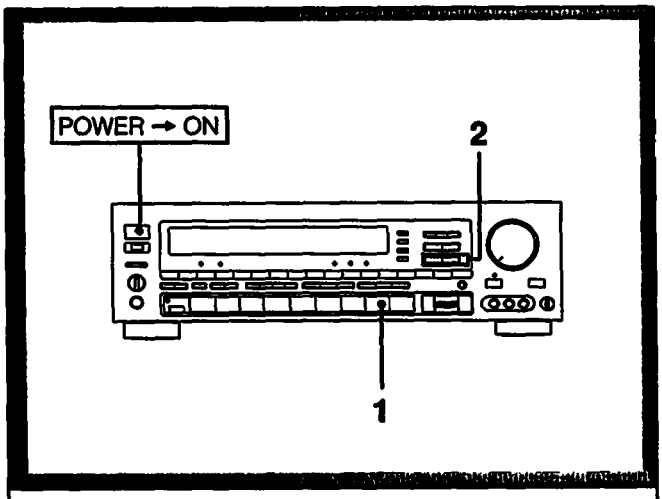
Replacing a preset station
Preset another station on the number of the station to be replaced. The previously preset station will be erased.

Memorizing FM mode
The FM MODE setting is also memorized in the station presetting.
In step 2, select the STEREO or MONO mode with the FM MODE button, if necessary.

Tuning in a Preset Station (Preset Tuning)

There are two ways to perform the preset tuning.
In the method A, select the preset station with the PRESET –/+ button. In the method B, select by designating the desired preset station number directly with the numeric button.

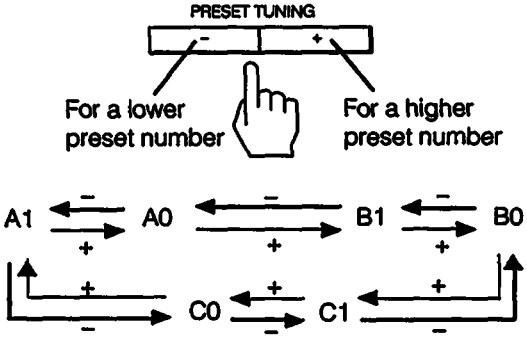
Method A



1 Press TUNER.

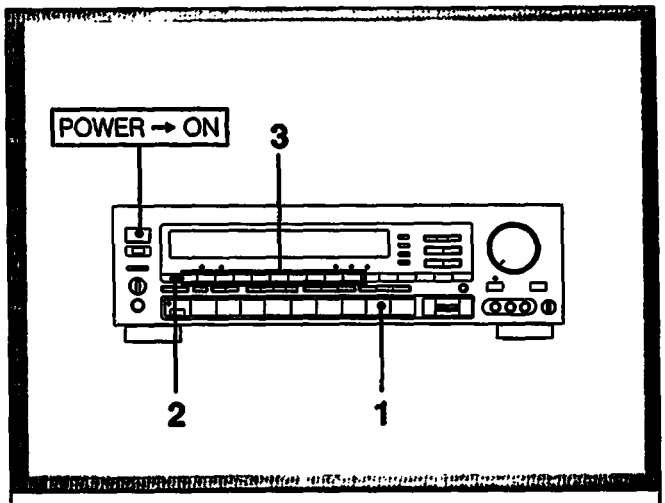
TUNER appears on the display.

2 Select the desired preset station with PRESET TUNING – or +.



IMPORTANT
The memorized station is maintained for approximately one month even if the power cord is disconnected from the AC power outlet. If they are erased, store the stations again.

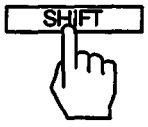
Method B



1 Press TUNER.

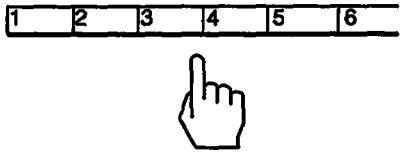
TUNER appears on the display.

2 Select the memory page (A, B, or C).



Each time SHIFT is pressed, A,B or C is indicated cyclically.

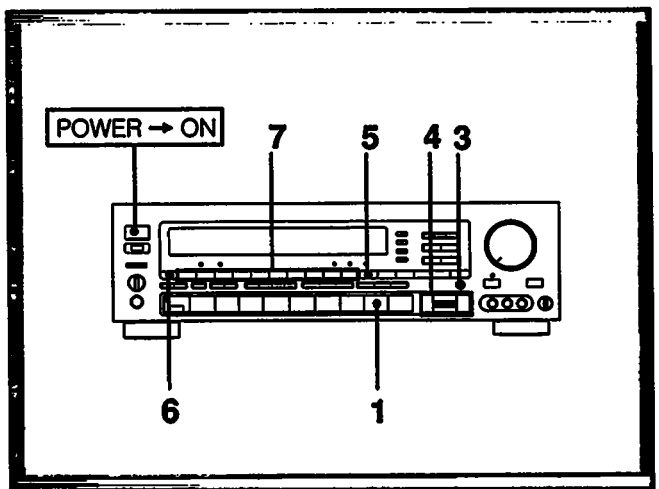
3 Designate the desired preset station number with the numeric button.



Receiving Radio Broadcasts

Labeling the Preset Stations (Station Index)

You can divide preset stations under index names you create (up to 5 characters). If you want to categorize the preset stations by kinds of music, for example, create indexes such as ROCK, JAZZ, etc.

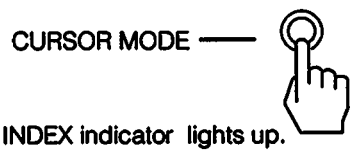


1 Press TUNER.

TUNER appears on the display.

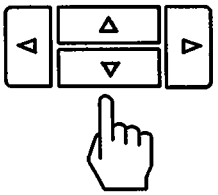
2 Tune in the desired station with Preset Tuning.

3 Press CURSOR MODE.



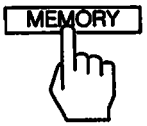
The INDEX indicator lights up.

4 Create an index name.



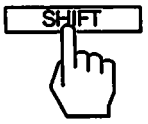
To select a letter or number, press △ or ▽.
To change the position, press ◁ or ▷.

5 Press MEMORY.

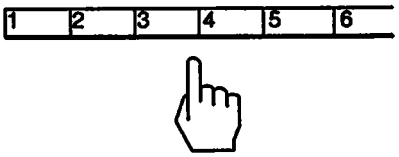


MEMORY appears on the display.

6 While MEMORY appears, select memory page (A, B or C).



7 While MEMORY appears, press the desired number.



8 Repeat steps 2 through 7 for all other stations you want to assign an index name.

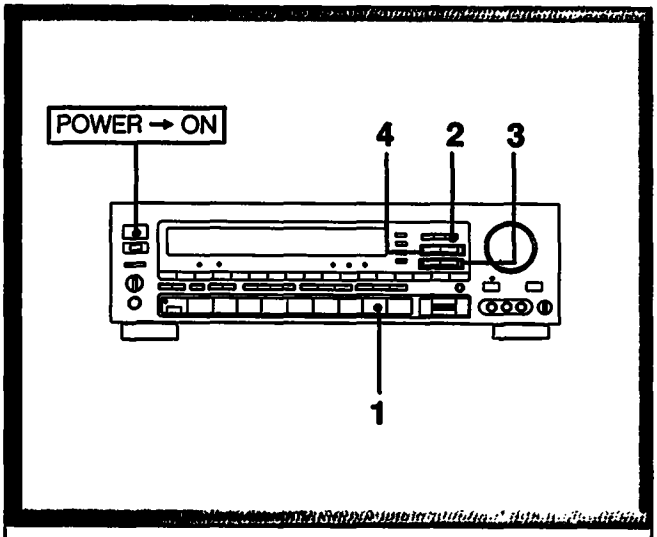
If you store an already categorized station under any other index name
Only the last selected category will be valid. Each station can be stored under only one index name

To display the frequency and index name of preset stations
Each time DISPLAY FREQ/INDEX is pressed, frequency and index name of the preset station are alternately displayed.

To usable letters and symbols

!→#+%&'( )*+,-./0123456789:;<=>?↑ABCDE
FGHIJKLMNOPQRSTUVWXYZ[\]II_↓abcdefghijklm
nopqrstuvwxyz

Selecting a Station among the Preset Stations in the Index (Index Tuning)



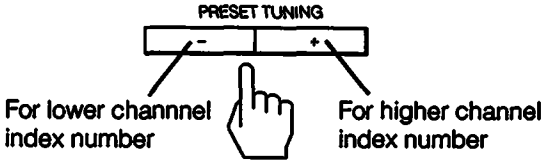
1 Press TUNER.

TUNER appears on the display.

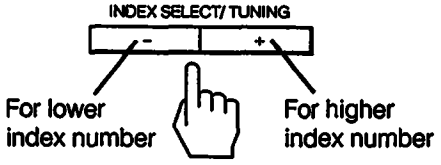
2 Press DISPLAY FREQ/INDEX to set to the INDEX mode.

When the no index name is memorized, "no-index" appears on the display.

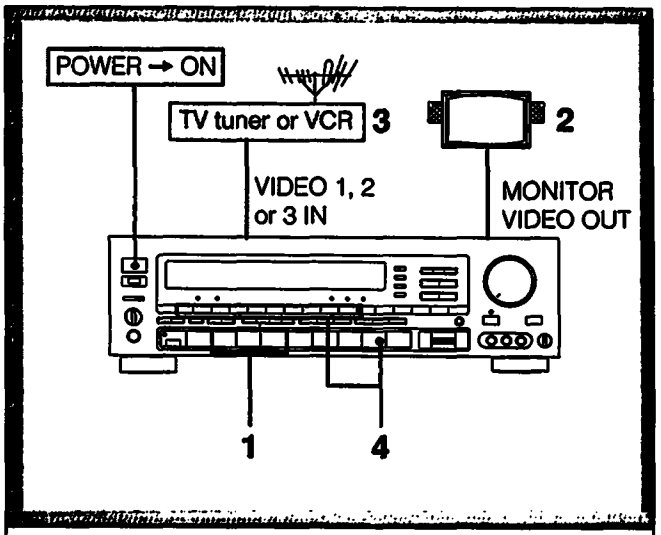
3 Select the desired station with PRESET TUNING – or + . (Same index)



4 To select another index station.



Receiving FM Simulcast TV Programs

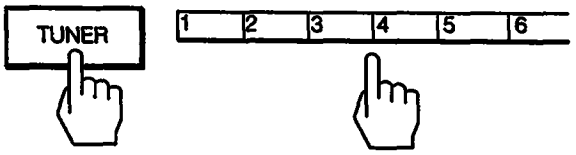


1 Select VIDEO 1, VIDEO 2/LD or VIDEO 3.
VIDEO 1, VIDEO 2/LD or VIDEO 3 appears on the display.
According to video inputs connected to an equipment to which the VHF antenna is connected.

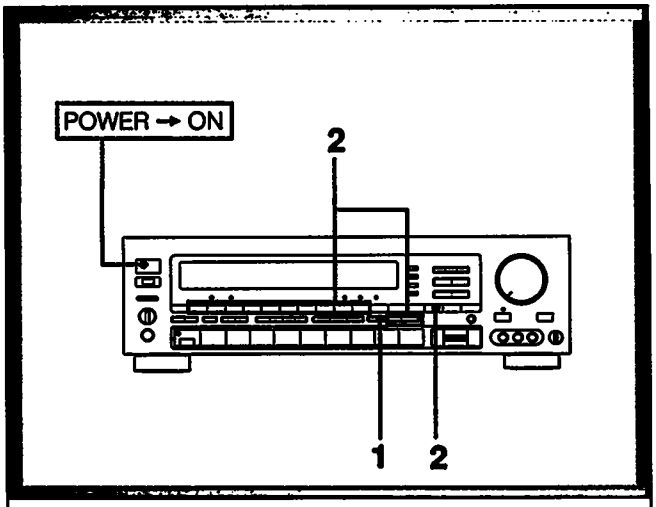
2 Turn on the monitor TV.

3 Select the desired program on the TV tuner or the VCR.

4 Select TUNER and tune in the FM simulcast TV program on the receiver.



Selecting a Factory-preset Sound Effects



1 Press USER/PRESET.
PRESET appears on the display.

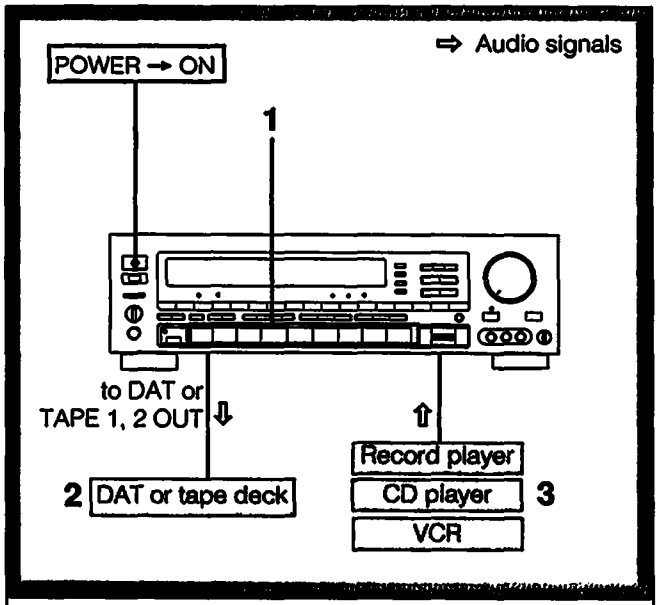
2 Press the numeric button or SOUND FIELD – or +.
The indicator of the desired sound field program number appears on the display.
In the tuner mode, first press SOUND FIELD RECALL and then press the numeric button or SOUND FIELD – or +.

Preset number	Applications
1	For orchestral music
2	For chamber music or an instrumental solo
3	For operas or musicals
4	For church music or the pipe organ
5	For jazz
6	For disco music
7	For live concert in an open-air stadium
8	For music programs on video tapes or laser discs
9	For movie programs on video tapes or laser discs
10	For Dolby surround encoded video programs

Refer to page 34 for the characteristic of each mode.

Recording an Audio Source

Recording onto an Audio Tape Deck or DAT Deck



1 Select the desired program source with the function selector.
For an FM/AM broadcast, tune in the desired station

2 Set the tape (DAT) deck in the recording mode.

3 Start playback of the selected program source.

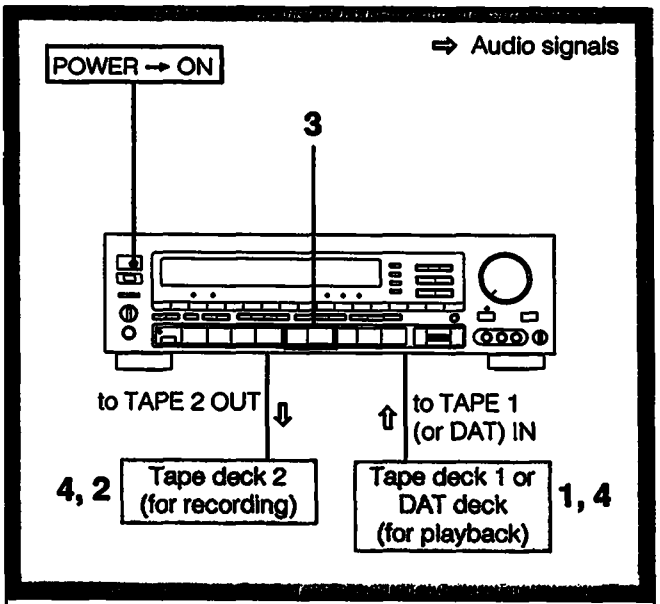
Note on recording

- Use TAPE 2 REC OUT for the recording with the surround, equalizer and DDS effects.
  For other REC OUT jacks, the settings of the volume, surround, balance, equalizer and DDS effects do not have any effect on recording.

Monitoring the recorded sound

If you have connected a 3-head tape deck to the TAPE 2 jacks, you can monitor the recording results. While recording or dubbing, press TAPE 2 MONITOR so that the TAPE 2 MONITOR indicator lights up. To listen to the source sound again, press the button again so that the indicator goes off.

Tape Dubbing



1 Insert the recorded tape into tape deck 1 (or the DAT deck).

2 Insert a blank tape into tape deck 2 and adjust the recording level.

3 Press TAPE 1 or DAT to select the deck for playback.

4 Start the playback of the tape (or the DAT) in tape deck 1 (or the DAT deck), and set tape deck 2 in the recording mode.
Dubbing will start.

Note on tape dubbing

Tape dubbing is possible only in the following directions:

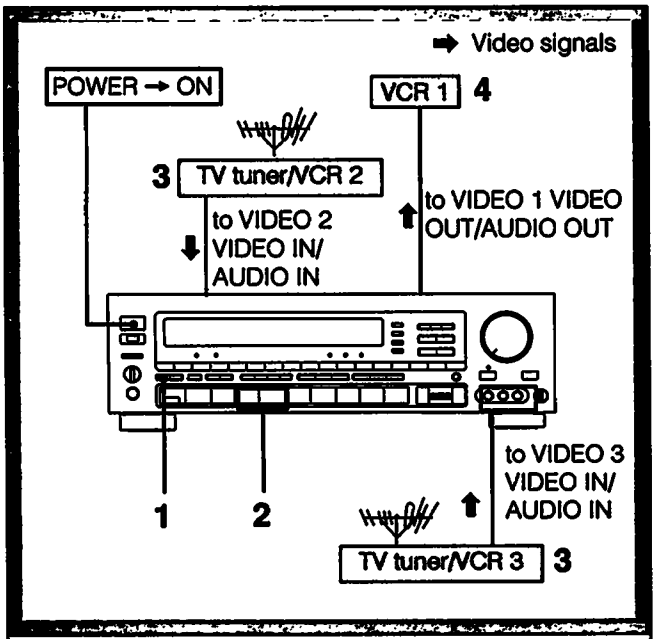
From (playback deck)	To (Recording deck)
Tape deck connected to TAPE 1 IN	Tape deck connected to TAPE 2 OUT
	DAT deck connected to DAT OUT
DAT deck connected to DAT IN	Tape deck connected to TAPE 1 or 2 OUT

Press the function selector according to the playback deck.

Editing a Video Source

Video Tape Dubbing

If the AUDIO indicator is lit in the display window, press the EDIT AUDIO button to make the indicator go out.



1 Select the playback VCR with EDIT VIDEO.
To select VCR 2, press EDIT VIDEO so that "2▷ 1" appears on the display.
To select VCR 3, press EDIT VIDEO so that "3▷ 1" appears on the display.

2 Press VIDEO 2/LD or VIDEO 3 to select the video signal to monitor on the monitor TV according to the VCR to be played.
VIDEO2/LD : for the VCR 2
VIDEO 3: for the VCR 3

3 Set the playback VCR to the playback mode.

4 Set the VCR 1 to the recording mode.
Dubbing will start.

To listen to an audio program during video tape dubbing

1 Press the appropriate function selector.
2 Start the selected audio program source.

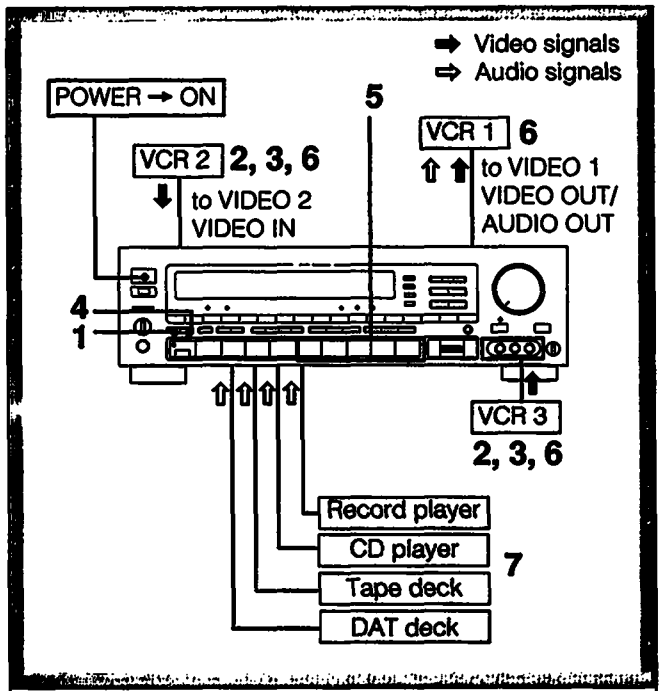
Video Tape Editing

To switch the playback VCR during dubbing
Press EDIT VIDEO. Each time you press the button, the playback VCR switches from the VCR 2 to the VCR 3 (or the VCR 3 to the VCR 2).

To view the other video source(s) on the monitor TV during dubbing
Press the appropriate function selector, VIDEO 1, VIDEO 2/ LD, or VIDEO 3.

Adding New Sound on a Video Tape during Video Editing

During video tape editing, you can add the desired sound on the recording VCR from various audio program sources.



1 Select the playback VCR with EDIT VIDEO.
To select VCR 2, press EDIT VIDEO so that "2▷ 1" appears on the display.
To select VCR 3, press EDIT VIDEO so that "3▷ 1" appears on the display.

2 Set the playback VCR to the playback mode.

3 At the point where audio dubbing starts, press the pause button on the playback VCR.

4 Press EDIT AUDIO.

AUDIO appears on the display.

5 Select the audio program source with the function selectors.

6 Release the pause mode of the playback VCR and set the VCR 1 to the recording mode.

7 Start playback of the selected audio program source.
Video dubbing starts and the audio program source is also recorded on the VCR 1 simultaneously.

What Is the Digital Signal Processor ?

The STR-D3070X/D2070X incorporates digital signal processing circuitry which consists of a digital surround processor, a digital parametric equalizer, and a digital dynamic sound (DDS) controller.

- The digital surround processor electronically reproduces the acoustics of various listening situations.
- The digital parametric equalizer controls the output level of specific frequencies to finely adjust the frequency responses.
- The digital dynamic sound (DDS) controller compresses or expands the dynamic range of the program source.

These three digital sound effects allow you to create the optimum sound quality and sound atmosphere in your room.

10 recommended sound field programs (combination of settings of the surround, parametric equalizer, and digital dynamic sound) have been preset in the factory. Since these programs are appropriate for the most types of music and listening situations, you can enjoy the digital sound effects by just selecting the sound field programs according to the program source. And you can also manipulate various parameters to finely tune the factory-preset settings to your room, or create original sound effects as you like. (Page 35)
To understand the digital sound effects, use the demonstration mode incorporated in the unit.

This manual described about the sound field program in the following order:

Surround effect
Digital parametric equalizer
Digital dynamic soud (DDS)
Storing your private sound field program

To Start the Demonstration Mode

While pressing MUTING, press DDS.
The receiver enters the demonstration mode in which the receiver demonstrates its functions in the following order.

- Equalizer control (Page 38)
- Sound field settings (Page 28)
- Surround effect (Page 34)
- Station index (Page 26)
- Dual room link control (Page 44)

To stop the demonstration
Press any button.
The receiver enters the mode designated by the pressed button.

Selecting the Sound Field

Table of Adjustable Parameters

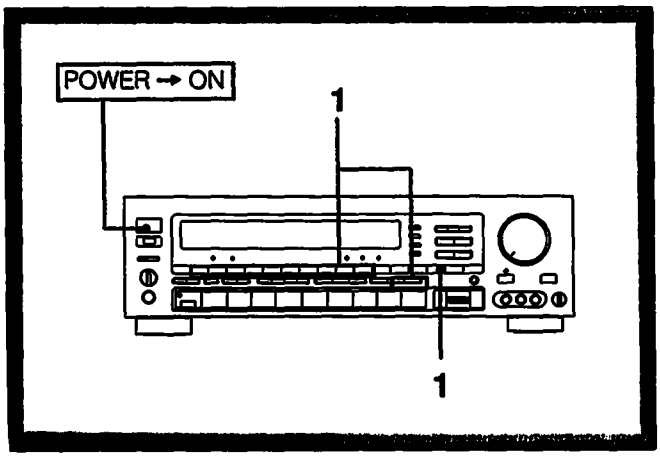
The surround sound, digital parametric equalizer and digital dynamic sound (DDS) have each adjustable parameter.

Parameter \ Surround mode		HALL 1	HALL 2	OPERA	CHURCH	JAZZ CLUB	DISCO	STADIUM	LIVE CONCERT	THEATER	DOLBY SURROUND
Equalizer		•	•	•	•	•	•	•	•	•	•
DDS		•	•	•	•	•	•	•	•	•	
Surround sound	Room size	•	•	•	•	•	•	•	•	•	
	Wall	•	•	•	•	•	•	•	•	•	
	Seat position front/rear	•	•	•	•	•	•	•	•	•	
	Seat position left/right	•	•	•	•	•	•	•			
	Effect level	•	•	•	•	•	•	•	•	•	
	Reverb time	•	•	•	•			•	•		
	Delay time*										•
	Rear level*	•	•	•	•	•	•	•	•	•	•
	Center level*								•	•	•

Refer to pages 35 to 39 for adjusting these parameter.

Note
The digital sound effects (the surround, parametric equalizer, and digital dynamic sound controller) cannot be obtained with the program source connected to the TAPE 2 MONITOR.

Selecting the Sound Field Mode



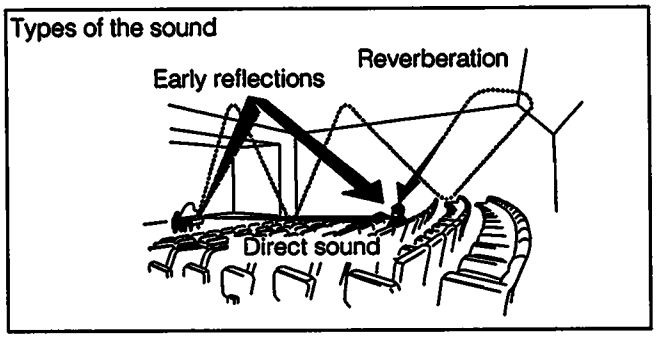
1 Press the numeric button or SOUND PRESET – or +.
The indicator of the desired sound field program number appears on the display.
In the tuner mode, first press SOUND FIELD RECALL and then press the numeric button or SOUND PRESET – or +.

Adjusting the Surround Effects

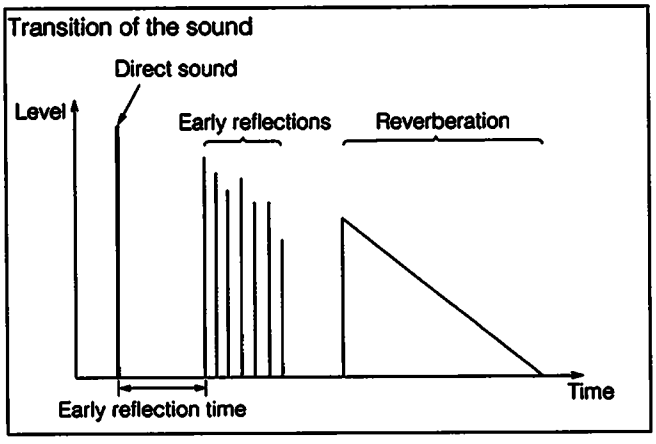
Understanding the Digital Surround Processor

The sound heard in a place such as a concert hall or a movie theater consists of direct sound, and early reflected sound (early reflections) and a reverberative sound (reverberation). The acoustics of the room affect the way these three sounds are heard. We can estimate the size or the type of a hall by listening to and differentiating these three kinds of sound.

The STR-D3070X/D2070X reproduces the early reflections and the reverberation using its digital signal processor and allows you to design a variety of sound field in your own room. The unit incorporates 10 types of surround modes, and you can select the surround mode by pressing SURROUND MODE. Also you can adjust several parameters within each mode to maximize the effect in your listening room.



The sound transition of the direct sound, early reflections and reberveration can be illustrated as below:



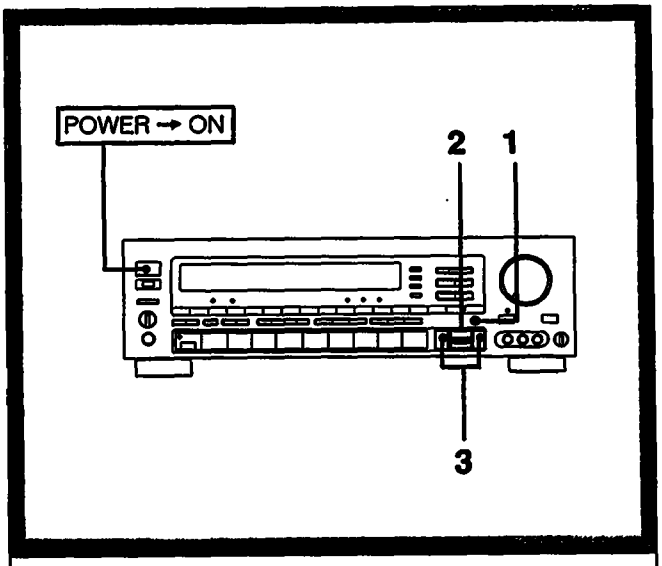
Note
Each surround mode has several internal (fixed) parameters in addition to the adjustable parameters explained in this section. Therefore, surround modes will not become the same even if you set all adjustable parameters the same.

Characteristics of the Surround Modes

Preset No.	Surround mode	Characteristics	Appropriate music source
1	HALL 1	Reproduces the acoustics of a rectangular concert hall with soft sound. It is effective for playing a program source with hard sound.	Solo or medium-size orchestra
2	HALL 2	Reproduces the acoustics of a vineyard type concert hall with a large early reflection effect. HALL 2 simulates a large hall than HALL 1 with walls made of wood and stone. Bright sounds are reproduced.	Large-size concert play such as the orchestra
3	OPERA	Reproduces the acoustics of an opera house, keeping the clearness of the vocal music.	Opera
4	CHURCH	Reproduces the acoustics of a church made of wood.	Baroque music, string orchestra or choral group
5	JAZZ CLUB	Reproduces the acoustics of a live house. The equalizer boosts high frequencies, adding sharpness to sounds.	Jazz
6	DISCO	The equalizer boosts high and low frequencies, and the dynamic sounds are reproduced.	Pops
7	STADIUM	Reproduces the acoustics of an outdoor stadium with a long pre-delay time. It is effective for playing a program source recorded in a stadium.	Pops
8	LIVE CONCERT	Adds the reflection of a large concert hall to decoded signals of the Dolby prologic decoder.	Dolby surround processed music software
9	THEATER	Adds the reflection of a theater to decoded signals of the Dolby prologic decoder.	Dolby surround processed movie software
10	DOLBY SUR-ROUND	Decodes programs processed with the Dolby surround.	Dolby surround processed software

Adjusting the Parameters

Before adjusting parameters, play back the program source. You can adjust parameters while listening to the actual sound.



1 Press CURSOR MODE button.
The SURR (surround) indicator lights up.

2 Press △ or ▽ to select the desired parameter.

3 Adjust the parameter by pressing ◁ or ▷.

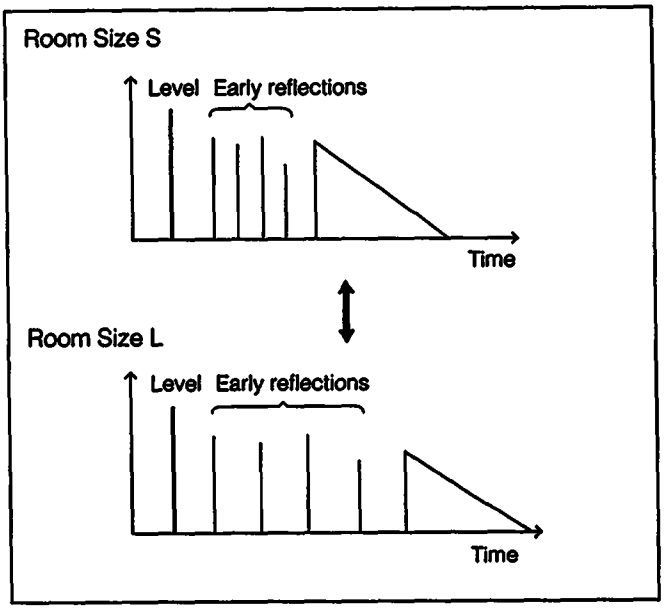
Note
If the unit is not in the SURR (surround) mode in step 2 above, "surround off!" appears after you finish adjusting parameters.

Tips for adjusting the main parameters
The following procedure allows you to make the desired sound field more effectively.

1 Select the desired factory-preset sound field program.
2 Adjust the effect level.
3 Adjust the reverberation time.
4 Adjust other parameters, if necessary.

■ Room Size Simulation

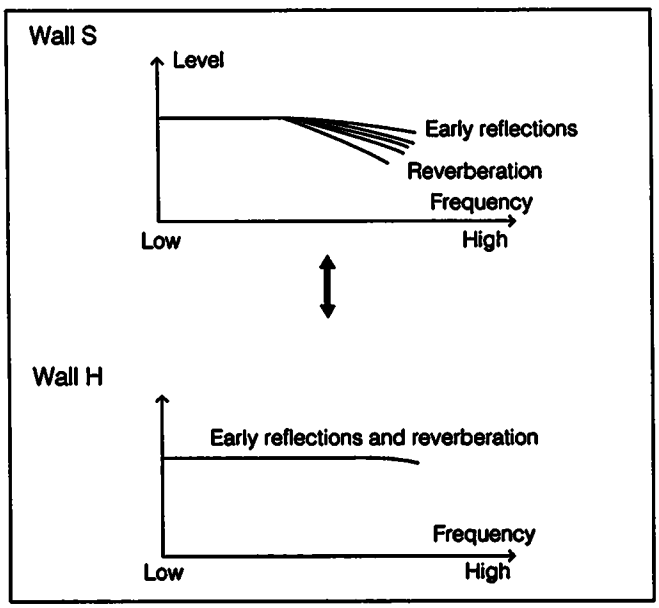
The sound emitted from a sound source is reflected many times between the left and right walls, ceiling, and floor before it reaches our ears. In a large room, the sound takes more time to bounce from one surface to another than in a smaller room.
The ROOM parameter controls the spacing of early reflections to simulate the room size. The S indicator on the display signifies a small room, the L indicator signifies a large room and the middle point designates the standard room size.



Adjusting the Surround Effects

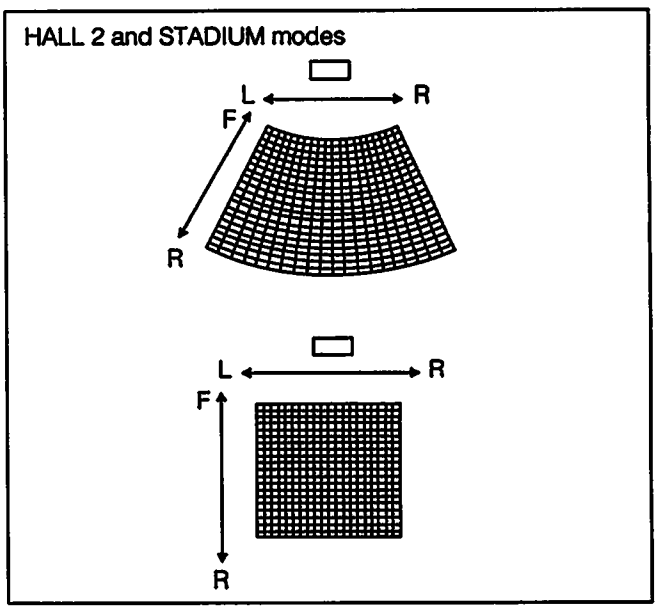
■ Wall Material Simulation

When sound is reflected by a wall made of soft material such as wood or a wall covered with a curtain, the high frequency components are reduced. A hard wall is highly reflective and does not significantly effect the frequency response of the reflected sound.
The WALL parameter controls the level of high frequencies to simulate the wall material. The S indicator on the display signifies a soft wall, the H indicator signifies a hard wall, the middle point designates the standard wall made of wood.



■ Seat Position Simulation

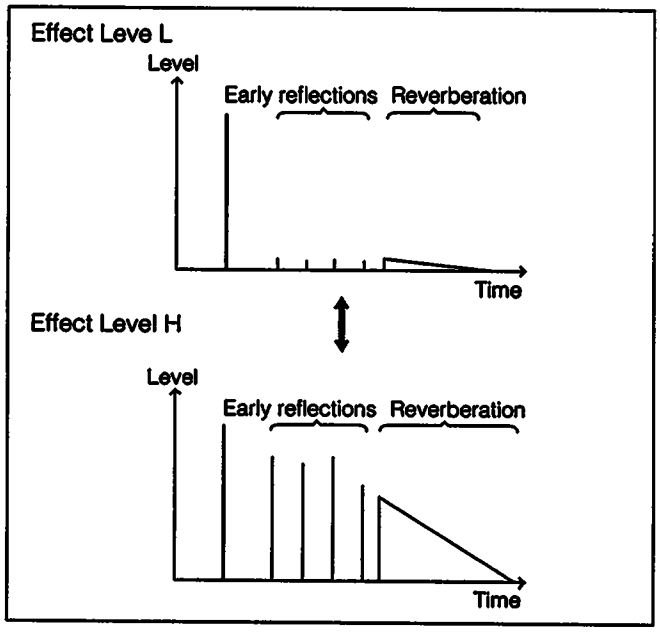
When you sit in the front of a room, you will hear more direct sound from the front speakers, and the component of reflected sounds from the front speakers grows as you move to the rear. Similarly, the component of reflected sound changes when you move from left to right, and vice versa. The F/R and L/R parameters control the balance of the direct and reflected sound and other components of sound to simulate your listening position.
When adjusting the F/R parameter, the F indicator on the display signifies the front position of the room, the R indicator signifies the rear position, the middle point of the indicator designates the center position. When adjusting the L/R parameter, the L indicator signifies the left position of the room, the R indicator signifies the right position, and the middle point of the indicator designates the center position.



Note
You cannot adjust the L/R parameter in the LIVE CONCERT and THEATER mode.

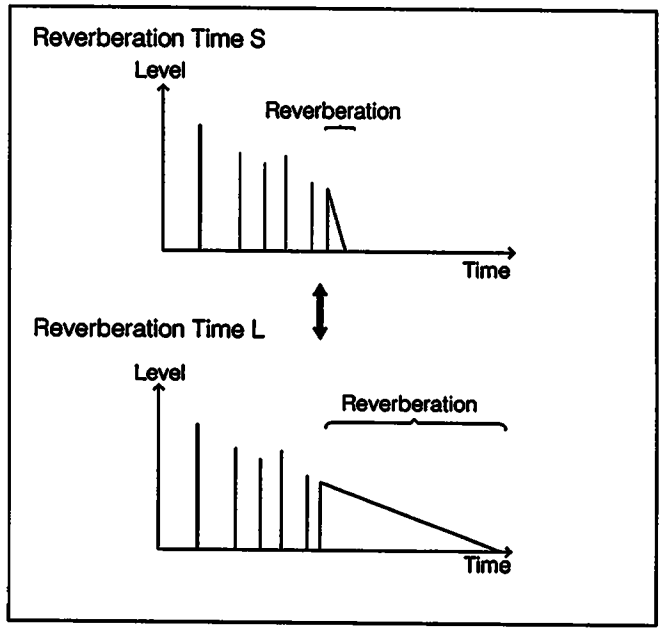
■ Effect Level

Effect level is the combination of the level of early reflections and reverberation. The L indicator on the display signifies the lowest level and the H indicator signifies the highest level. The adjustable level is divided into 20 segments. As you select higher level, the room becomes more "live", and as you select lower level, the room becomes "dead".



■ Reverberation Time

This parameter adjusts the length of the reverberation — the time required for reverberative sound to decrease to –60 dB. The S indicator on the display signifies the shortest reverberation time, the L indicator signifies the longest reverberation time.



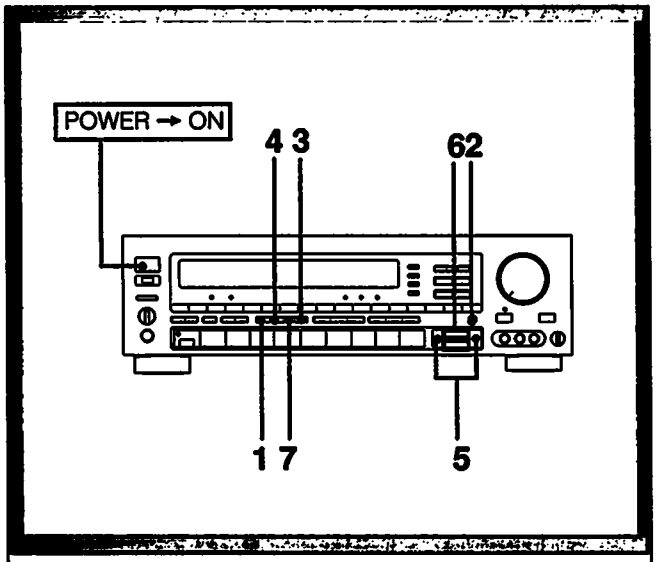
Adjusting the Digital Parametric Equalizer

Understanding the Digital Parametric Equalizer

The parametric equalizer is a tone control system with adjustable center frequency and slope (Q). The STR-D3070X/D2070X provides flexible equalization using one-band parametric equalizer with center frequency and slope, and 2-band shelving equalizers with adjustable turnover points.
The equalization curve appearing on the display allows you to accurately adjust the sound quality. The parametric equalizer effects all line output signals including SURROUND (REAR), CENTER.

How to Adjust the Digital Parametric Equalizer

Before adjusting the digital parametric equalizers, play back the program source. You can adjust the equalizer while listening to the actual sound.



1 Press EQUALIZER ON/OFF to ON.
If EQUALIZER ON/OFF is set to OFF, "equalizer off!" appears after you finish adjusting the parameter.

2 Press CURSOR MODE.
The EQ (equalizer) indicator lights up.

3 Press DISPLAY RTA (real time analyzer) until the equalization curve appears on the display.

4 Press EQUALIZER BAND to select a frequency band.
B: Bass
M: Middle
T: Treble

5 Press ◁ or ▷ to select the frequency you want to adjust.

6 Press △ or ▽ to raise or lower the level of the selected frequency.

7 Adjust the frequency level of the mid range by pressing EQUALIZER SLOPE if necessary.

8 Repeat steps 5 through 7 for other frequency bands until you obtain the desired equalization curve.
To restore the real time analyzer or peak hold mode, press DISPLAY RTA.

To make the equalization curve flat
Press EQUALIZER ON/OFF to OFF.
You can create a new equalization curve.

Spectrum analyzer display
Every time you press DISPLAY RTA (Real Time Analyzer), the display of equalizer curve, real time analyzer and peak hold is cyclically switched. Each display shows the following:
— Equalizer curve shows the settings of the equalizer controls.
— Real time analyzer (RTA type-1) shows the level of each frequency range.
— Peak hold mode (RTA type-2) shows that this mode holds the highest input of each frequency range for several seconds.
— Real time analyzer (RTA type-3) shows the highest level of each frequency range.

When the center frequency band overlaps the bass or treble frequency band during adjustment
The setting level of each band will accumulate.
The equalization curve appears only between ±12 dB.

Adjusting the Digital Dynamic Sound (DDS) Controller

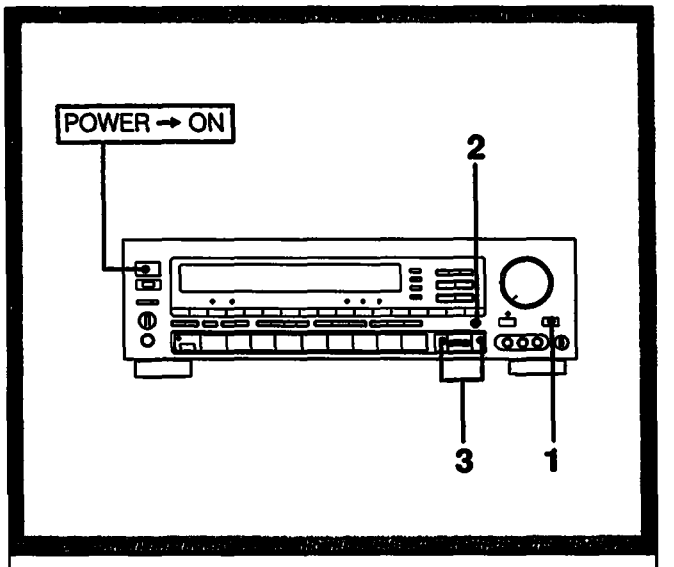
Understanding the DDS Controller

The STR-D3070X/2070X allows you to select either of two digital dynamic sound controls, compressor or expander. The compressor compresses the dynamic range of the output signal to increase the average output level without distortion. This function is useful for obtaining dynamic sound at small output levels or when recording a program source with a wide dynamic range, such as a compact disc, on a cassette tape. On the other hand, the expander limits the dynamic range of the input signal to eliminate undesired noise. You can set the compressor or expander effect in 9 increments.

How to Adjust the DDS Controller

Before adjusting the digital dynamic sound controller, play back the program source. You can adjust the controller while listening to the actual sound.

IMPORTANT
You cannot operate the DDS controller when the DOLBY SURROUND mode is selected. If you select DOLBY SURROUND with SURROUND ON/OFF set to ON, the DDS controller is automatically turned off. To turn on the DDS controller, select another mode.



1 Press DDS.
If DDS is not pressed, "DDS off!" appears after you finish adjusting.

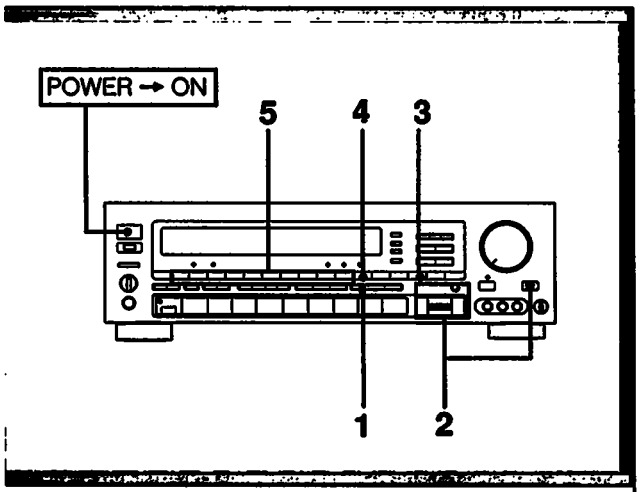
2 Press CURSOR MODE.
The DDS indicator lights up.

3 Press ◁ or ▷ to adjust the compressor or expander.

Storing Your Private Setting (Sound Field Memory)

ou can store up to 10 digital sound effects (combinations
the settings of surround, parametric equalizer and DDS
ou create into the memory and recall them.
ou can also link these 10 sound field effects to preset
ations.

Storing Your Private Setting



1 Press USER/PRESET.
USER appears on the display.

2 Set the parameters of surround, parametric equalizer and DDS controller.

3 Press SOUND FIELD RECALL (when the receiver is in a mode other than TUNER, skip this step).

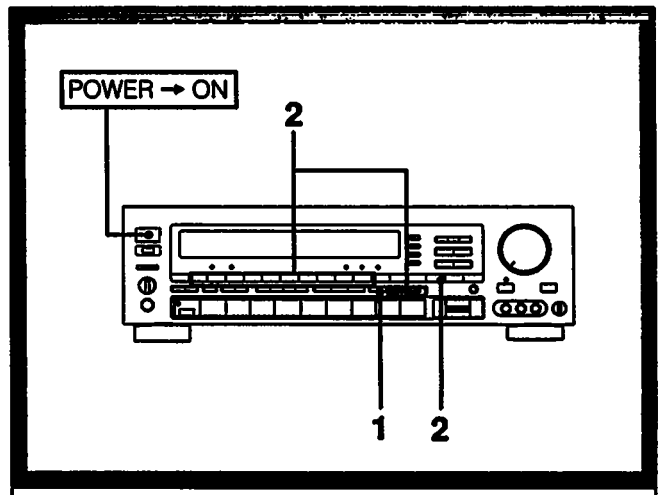
4 Press MEMORY.

5 Press the numeric button to be stored (1 to 0).

/hen you store a new digital sound field effect
he sound effect for the same user preset number will be
eplaced.

:ven if AC power cord is disconnected
he stored data is maintained for approximately 2 weeks.

Calling up the Sound Field Setting

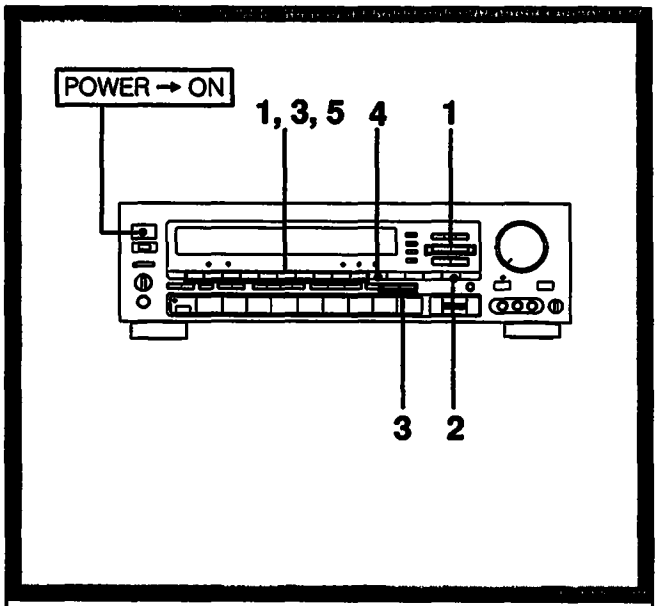


1 Press USER/PRESET.
USER appears on the display.

2 Press SOUND FIELD + or – or the numeric buttons.
In the tuner mode, first press SOUND FIELD RECALL and then the numeric buttons.

Restoring to the setting stored at the factory
Press POWER while pressing SOUND FIELD +. All of the 10 settings are then restored.

Linking the Sound Field Memory to Preset Stations



1 **Tune in a station to be preset with sound field data.**

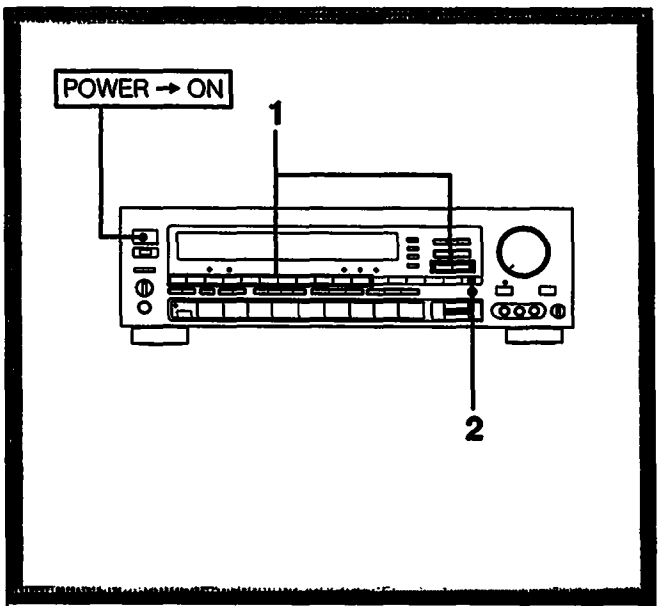
2 **Press PRESET SF LINK PGM.**

3 **Press the numeric buttons (1 to 0) or SOUND FIELD + or – to select desired sound field effect.**

4 **Press MEMORY.**

5 **Press the numeric button corresponding to the station number to be linked.**

Receiving the Preset Station Stored with the Linked Sound Field Setting



1 **Receive the preset station.**

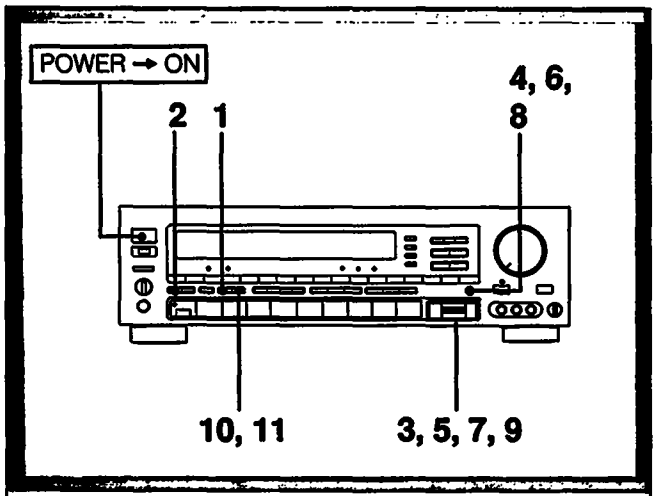
2 **Press PRESET SF LINK ON/OFF.**
LINK ON appears on the display.

To change sound field setting
Press PRESET SF LINK ON/OFF to OFF, and then adjust the sound effect as you desire.

Superimposing the Title and Illustration (STR-D3070X Only)

The title function allows you to select the desired types of title, illustration and colors of characters and back ground and superimpose them. The placement of the title, illustration and characters can be also changeable.

How to Use the Titler Function

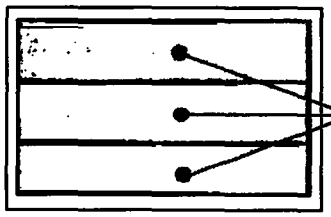


1 Press TITLE ON/OFF to set to ON.

2 Select the playback VCR with EDIT VIDEO.
To select VCR 2, press EDIT VIDEO so that "2▷ 1" appears on the display. The VCR 2 is automatically selected.
To select VCR 3, press EDIT VIDEO so that "3▷ 1" appears on the display. The VCR 3 is automatically selected.
- The playback VCR cannot be selected with the function selectors.

3 (1) Select a desired title from the 12 types of title including no title with △ and ▽.

(2) Select the position where the title is placed among 3 positions with ◁ and ▷.
The title setting is completed.

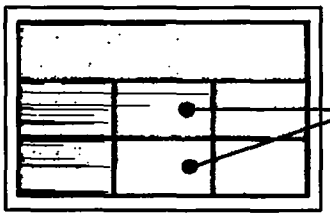


3 positions where the title can be placed.

4 Press CURSOR MODE/TITLE MENU to enter the illustration setting.

5 (1) Select a desired illustration from the 17 types of illustration including no illustration with △ and ▽.

(2) Select the position where the illustration is placed among 6 positions, except the positions where the title is placed, with ◁ and ▷.
The illustration setting is completed.
The position where the title has been already placed cannot be selected.



6 positions where the illustration can be placed.

6 Press CURSOR MODE/TITLE MENU to enter the setting of characters.

7 (1) Select the position where the characters are placed with ◁ and ▷.
The position where the title or illustration has been already placed cannot be selected.
Up to 27 characters can be selected for the 1st line, 2nd line and 3rd line. (Up to 81 characters in total.)

(2) Select the characters with △ and ▽.
Usable letters and symbols
!→#+%&'( )*+,–./0123456789:;<=>?↑ABCDE
FGHIJKLMNOPQRSTUVWXYZ[\]II_↓abcdefghijklm
nopqrstuvwxyz|←–+→□■▪●▲▼◀▶♦♥♠♣ _

8 Press CURSOR MODE/TITLE MENU to enter the color setting of the character.

9 (1) Select a desired color of the character from the 17 types of colors including the transparent with △ and ▽.

(2) Select the color of the background from the 17 types of colors including the transparent with ◁ and ▷.
The color setting of the characters is completed.

10 Operate the playback VCR to locate the desired point where you want to place the title and illustration and press TITLE IN/OUT to IN at the desired point.
TITLE IN appears on the display. At the same time, the unit enters the monitor mode of VCR 1 automatically and the title and illustration which are superimposed on the picture of VCR 1 can be monitored.
- At this time, the playback VCR cannot be selected with the function selectors.

11 At the point where you do not want to place the title and illustration, press TITLE IN/OUT to OUT.
TITLE OUT appears on the display.

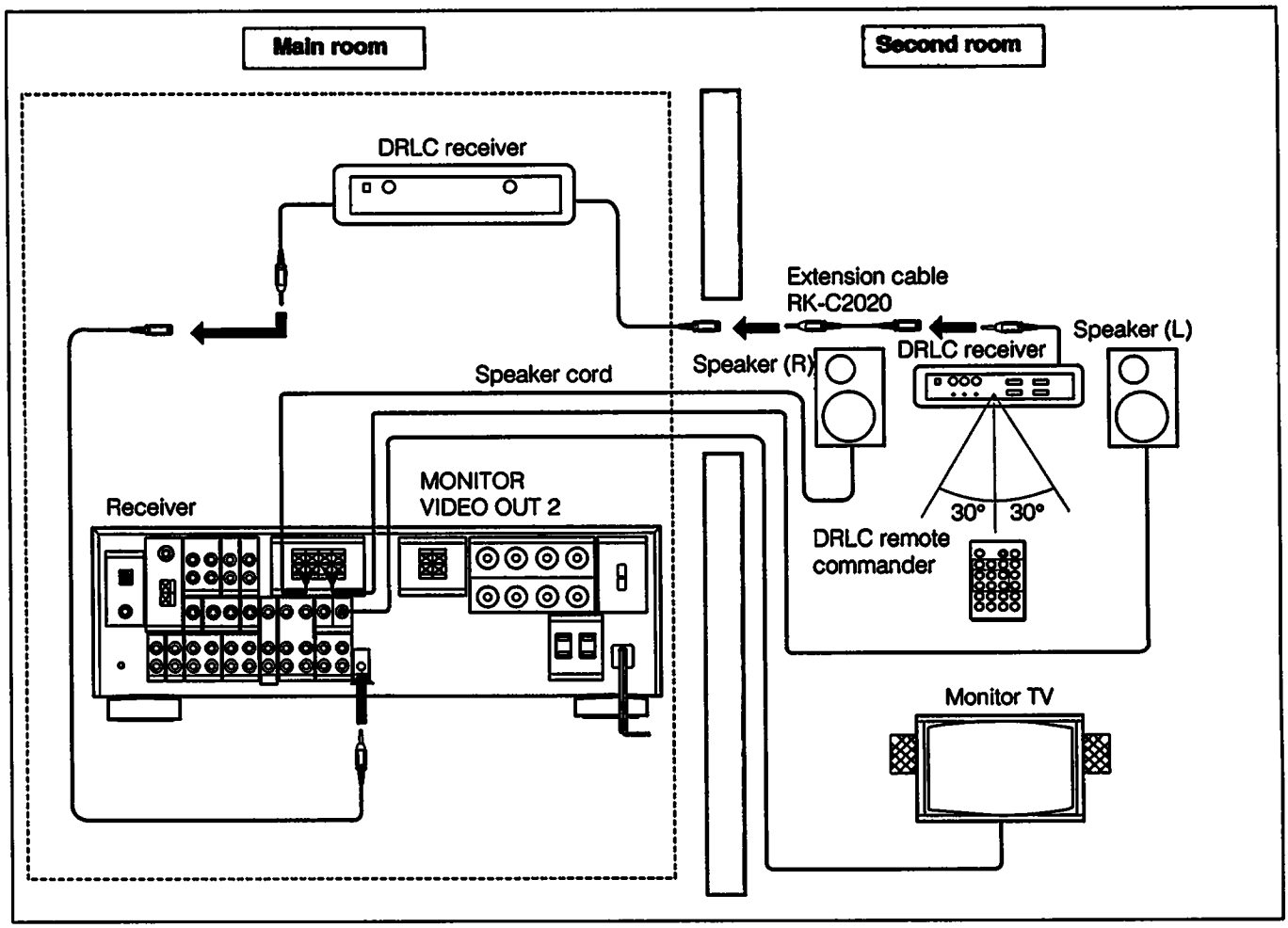
Notes

- When POWER is turned off, all the title, illustration and characters are initialized.
- When the position of the title or illustration is changed, that of the characters is also changed.
- When TITLE ON/OFF is set to ON, the cursor mode operation buttons cannot be used for the other functions than the title function.
- In the TITLE and ON SCREEN modes, the characters at both ends may not be displayed depending on the type of the monitor TV.

Controlling Speaker System in Two Rooms (Dual Room Link Control)

The Dual Room Link Control allows you to "link" a second room to your main or primary listening room.
When the RM-S2070K Dual Room Link Control Kit (optional) and optional speakers and monitor TV are properly connected to your audio system and they are placed in the second room, either the same program source being played in the main room or a different program source can be heard in the second room.

Hooking Up a System for the Dual Room Link Control



See page 7 to 11 for the connection in the main room.

Remotely Controlling the System

1 Press DRLC POWER. (The POWER switch on the receiver does not need to be turned on.)
2 To listen to CD or tape in the second room, press CD ► or DECK A or B ◄/►.
3 Control the system with the remote commander for the second room.

The following examples illustrate program source options for the main and second room:

Listening in the main room	**Listening in the second room**
CD	FM broadcast
TAPE	CD
Sound from TV	Same sound from TV
Off	FM broadcast
Sound from video source with surround effect	Off*
FM broadcast	Off

* When listening to the sound from video source with surround effect in the main room, the power of the system in the second room is automatically turned off.

Notes

- The surround system in the main room and DRLC function cannot be operated simultaneously.
- When the receiver receives a remote control signal from the second room, the DRLC POWER switch flashes. During this flashing, the receiver cannot receive the remote control signal from the main room.
- You cannot use the following functions from the second room.
  - Surround effect
  - Equalizer control
  - DDS
  - Muting
  - TAPE 2 MONITOR

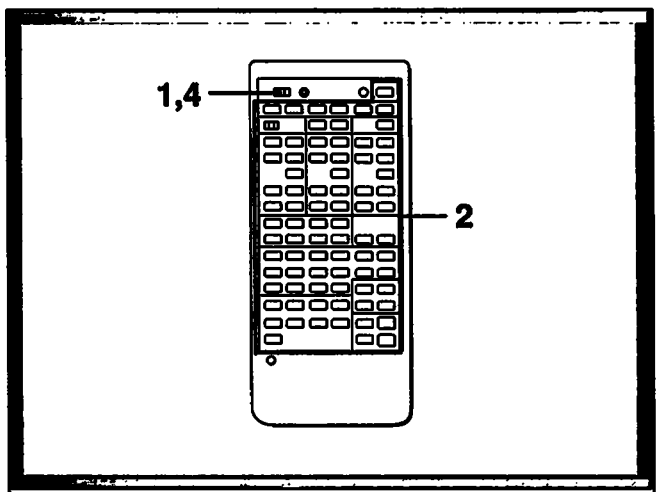
Please refer to the operating instructions of RM-S2070K for details.

Storing Other Manufacturer's Operating Codes Onto the Supplied Remote Commander

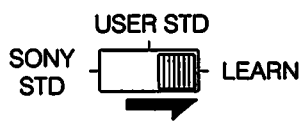
When you manipulate a switch or button on the commander, be sure to point the head of the commander toward the remote control sensor on the front of the receiver. If there is an obstacle between the receiver and the head of the commander, the receiver may not be controlled remotely.

Programming Signals of Other Audio/Video Equipment

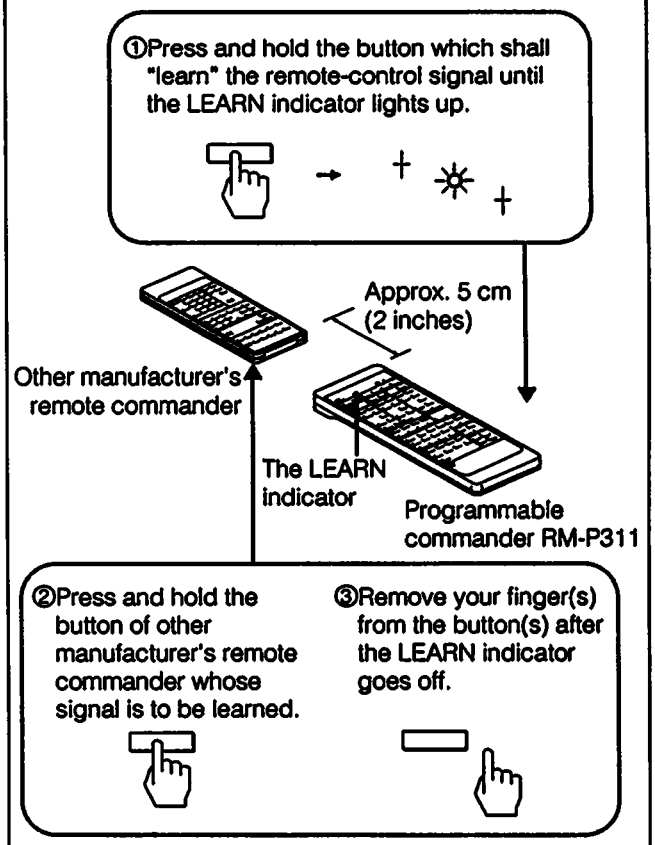
The RM-P311 learns various functions of other remote commanders emitting infrared rays and allows you to control most of audio and video equipment from a distance.



1 Set the mode selector to LEARN.



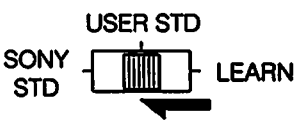
2 Program a signal.


①Press and hold the button which shall "learn" the remote-control signal until the LEARN indicator lights up.
Approx. 5 cm (2 inches)
Other manufacturer's remote commander
The LEARN indicator
Programmable commander RM-P311
②Press and hold the button of other manufacturer's remote commander whose signal is to be learned.
③Remove your finger(s) from the button(s) after the LEARN indicator goes off.

All buttons of enclosed as number 2 on the left illustration can be programmable.

3 Repeat operation for each button to be programmed.

4 Set the mode selector to USER STD or SONY STD.



The two remote commanders must:

- face straight each other.
- be placed at a distance of approx. 5 cm (2 inches).
- not be moved during programming operation.

After programming

Be sure to test if the equipment really works with the programmed signals.

Number of signals that the commander can learn

It depends on the format of the signal. If you program signals of Sony equipment, approximately 50 - 60 signals can be programmed.

Memory capacity
If the LEARN indicator flashes or does not go out in step **2-②, ③**, the memory capacity has become full. This occurs when other signals stronger than the remote-control signals have been stored because the signals were programmed in a noisy environment or the remote commanders were placed too far apart from each other. In this case, clear all the signals following the procedure described below and program again from the beginning under the proper conditions.

Notes on programming
- Remote-control signals of equipment of manufacturers other than Sony can be programmed only when they are compatible with the infrared wireless remote control system. Since the programmable commander can "learn" only the signals output from another remote commander, it cannot control equipment that does not use a remote commander.
- Do not attempt to use the programmable commander with an air conditioner or other household appliances.
- Note that there are some special remote-control signals that cannot be programmed.

Programming a new signal onto a previously programmed button

Follow the programming procedure.
The previously programmed signal is cleared and replaced by the new signal.

To clear all programmed signals
1 Set the mode selector to LEARN.
2 Press and hold any button of the programmable area until the LEARN indicator lights up.
3 Press PROGRAM CLEAR until the LEARN indicator flashes and goes off.

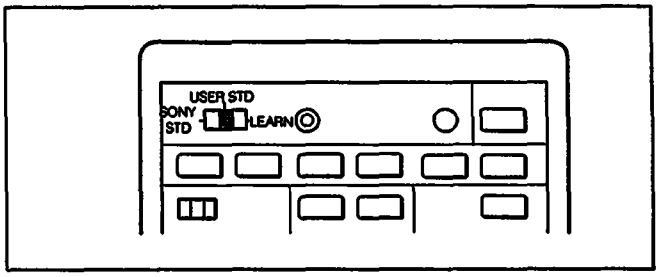
Note
It is not possible to clear the programmed content of just one button.

To program a signal onto the ● REC button in the TAPE or VTR section
It is not possible to operate any equipment with only the ● REC button. To program a signal under the ● REC button, press and hold the following buttons at the same time in step **2-①**.

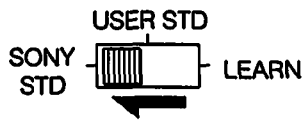
TAPE	DECK/VTR REC MODE [REV] [●] or DECK/VTR REC MODE [FWD] [●]
VTR	DECK/VTR REC MODE [FWD] [●]

Controlling Equipment

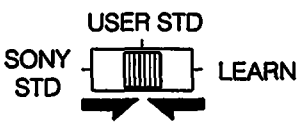
By switching the mode selector as shown below, a single button alternately controls Sony equipment and another manufacturer equipment.



To control Sony equipment



To control equipment with programmed signals



When Sony equipment cannot be remote-controlled
Program the signal in the same way as for equipment from other manufacturers. In this case, even with Sony equipment, set the mode selector to USER STD.

Notes on Battery
If the LEARN indicator does not light when a button is pressed, the batteries are almost exhausted.
When the batteries are exhausted, the remote commander can no longer operate the unit or programming becomes impossible.
If this happens, replace both batteries with new ones. We recommend the use of alkaline batteries for prolonged use.

If no signal has been programmed
The programmable commander can control Sony equipment even when the mode selector is set to USER STD.

If the equipment works incorrectly
Press RESET.
The programmed contents of the buttons are not cleared by pressing RESET.

Troubleshooting Guide

Before proceeding through the check list below, examine the connections and the procedures outlined in the manual. Should any problem persist after you have checked the following items, consult your nearest Sony dealer.

Problem	Cause	Solution
No FM station can be located by Auto-Tuning operation.	The signal strength of the stations is too weak.	Press TUNING LEVEL to set the receiving signal level low.
The STEREO indicator flickers or does not appear when receiving stereo programs.	A very weak FM station or a noisy FM program is received.	Adjust the antenna or connect an external FM antenna.
		Press FM MODE to set to MONO mode.
No station can be tuned in by Auto- Tuning operation.	The AM tuning interval is set incorrectly.	Change the tuning interval according to the AM frequency allocation system of your country. (See page 5)
	The signal strength of the station is too weak for Auto-Tuning.	Adjust the antenna.
		Directly tune in the stations. (See page 22)
No stations can be tuned in by pressing PRESET TUNING +/–.	No stations have been preset.	Preset the stations. (See page 24)
No sound is heard even if you adjust VOLUME.	The speaker or program source equipment is not connected correctly.	Connect the equipment correctly.
	The SPEAKERS selector is not set correctly.	Set the selector correctly.
	TAPE 2 MONITOR has been pressed for a program source other than tape deck 2. (The indicator is lit.)	Press the button to disengage.
	A wrong function selector has been pressed.	Press the correct function selector.
	The function switch on the VCR is not set correctly.	Check and set it correctly.
No sound or sound at very low level is heard from rear speakers.	Surround function is turned off.	Press SURROUND ON/OFF to turn on the function.
	Monaural program source is played back in Dolby surround mode.	Select the other modes.
Sound is heard only at a very low volume.	MUTING has been pressed. (The MUTING indicator is lit.)	Press the button to disengage.
One channel does not transmit audio, or the volume from the left and right speakers is unbalanced.	The BALANCE control is not set appropriately.	Adjust the BALANCE control.
	The speaker or program source is not connected correctly.	Check and properly connect the equipment.
There is an abrupt loss of sound from one or both of the speakers, and the PROTECTOR indicator flickers in the display window.	A short-circuit problem activates the protective circuit.	Turn off the unit, eliminate the short- circuit problem and turn on the power again. If there is no short-circuit problem, consult your nearest Sony dealer.

Problem	Cause	Solution
Sound transmitted from the speakers is reversed.	The speakers are not connected correctly.	Connect the right speaker to the R SPEAKER terminals and the left speaker to the L SPEAKER terminals.
There is lack of bass sound or the instrument position is obscure.	The ⊕/⊖ connection of the speaker is reversed.	Connect the speaker with the correct phase.
Severe hum or noise is heard.	The connecting cords are not shielded type.	Use shielded type cords.
	A transformer, motor, TV or fluorescent light affects the connecting cords.	Place the connecting cords in a location away from a transformer or motor, and at least 3 meters (10 feet) from a TV set or a fluorescent light.
	The audio components are too close to a TV set.	If both are used at the same time, separate the TV from the audio components.
	The unit is not grounded.	Connect the ground wire to the antenna ground terminal.
	The connections are loose.	Make secure connections.
	The plugs and jacks are dirty.	Wipe the plugs and jacks with a cloth lightly dampened with alcohol.
The CURSOR mode operation buttons do not function.	The unit enters the ON SCREEN mode.	Press ON SCREEN ON/OFF to disengage the ON SCREEN mode.
The ON SCREEN function cannot be available.	The MONITOR TV is connected to the S VIDEO OUT jack.	Connect to the MONITOR VIDEO OUT jack.
Surround effect cannot be obtained.	The unit is in a wrong mode.	Press CURSOR MODE to set the surround mode.
Surround effect cannot be adjusted.	Surround circuit is turned off.	Press SURROUND ON/OFF.
Equalization curve adjustment is impossible.	The unit is in a wrong mode.	Press CURSOR MODE to set the equalizer mode.
	Equalization circuit is turned off.	Press EQUALIZER ON/OFF.
Dynamic sound control effect cannot be heard.	Dynamic sound control circuit is turned off.	Press DDS to turn on the function.
	The DOLBY SURROUND mode is selected.	Select other surround modes.
The remote commander will not operate.	The batteries are exhausted.	Replace the batteries with new ones.
	The commander head is not pointed toward the unit's front.	Point the commander head toward the receiver.
	There is an object between the commander and the receiver.	Remove the object.
The commander signal cannot be programmed.	There is noise interference.	Place both remote commanders apart from the source of noise.
	The batteries are exhausted	Replace the batteries with new ones.
The LEARN indicator goes off after flashing.	The internal memory capacity is full.	Clear all the signals and program again. (See page 47)

Specifications

Audio Power Specifications

POWER OUTPUT AND TOTAL HARMONIC DISTORTION

With 8-ohm load, both channels driven, from 20 - 20,000 Hz, rated 120 watts per channel minimum RMS power, with no more than 0.015% total harmonic distortion from 250 milliwatts to rated output.

Other Specifications

Dynamic power output	8 ohms, at 1 kHz IHF	195 + 195 watts
	4 ohms, at 1 kHz IHF	250 + 250 watts
Harmonic distortion at rated output		Less than 0.015%
Intermodulation (IM) distortion at rated output		Less than 0.015%
Power output of center amplifier		30 watts (15 + 15 watts, 8 ohms at 1kHz)
Power output of surround(REAR)/ DRLC amplifier (8 ohms, at 1kHz)		15 + 15 watts
Frequency response	PHONO	RIAA equalization curve ±0.5 dB
	CD, DAT, TAPE 1,2 DIGITAL (OPTICAL, COAXIAL) VIDEO 1,2,3	10 Hz — 70 kHz $^{+0}_{-1}$ dB
Residual noise		Less than 70µV
Damping factor (8 ohms, at 1kHz)		50
Input sensitivity/ impedance	PHONO MM	2.5 mV, 50 kilohms
	DAT,CD, VIDEO 1,2,3 TAPE 1,2	150 mV 50 kilohms
	DIGITAL (COAXIAL)	0.5 Vp-p, ±20 %,75 ohms
	DIGITAL (OPTICAL)	TOSLINK
S/N	PHONO MM	87 dB 79 dB** (A,2.5mV)
	DAT, CD VIDEO 1,2,3 TAPE 1,3	105 dB 85 dB** (A,150mV)
Output sensitivity/ impedance	DAT OUT, TAPE OUT 1,2 VIDEO 1	150 mV 10 kilohms
	SPEAKERS	Accepts speakers of 8-16 ohms
	HEADPHONES	Accepts headphones of high and low impedance
	CENTER OUT, REAR OUT	2.5 V, 1kilohm
	PRE OUT	1 V, 1Kilohm
MUTING		-20dB

** '78IHF

Digital signal processor section

Modulation (A/D conversion)		High Density Linear Converter
Demonstration (D/A conversion)		High Density Linear Converter System (Pulse D/A Converter)
Sampling frequency		32 kHz, 44.1 kHz, 48 kHz
Equalizer	Band	3-band, Bass/treble Mid
	Turnover frequency	Bass: 99 Hz - 1 kHz Treble: 1 kHz - 10 kHz
	center frequency	Mid: 20 -18 kHz
	Level	±12 dB, 0.2 dB step
	Slope (Q)	3-step selectable, Wide, Mid, Narrow
DDS	compressor expander	9-step adjustable 9-step adjustable
Surround	ROOM SIZE	20-step adjustable
	WALL	20-step adjustable
	SEAT POSITION F/R	20-step adjustable
	SEAT POSITION L/R	20-step adjustable
	EFFECT LEVEL	20-step adjustable
	REVERB TIME	20-step adjustable
	DELAY TIME	15.0 ms-30. ms, 0.1 ms step
	REAR LEVEL	+10 - -50 dB, -∞, 1 dB step
	CENTER LEVEL	+10 - -50 dB, -∞, 1 dB step
	INPUT BALANCE	Automatic

FM tuner section

Frequency range		87.5 — 108.0 MHz
Antenna terminals		300 ohms, balanced 75 ohms, unbalanced
Sensitivity at 50 dB		18.3 dBf, 4.5 µV (mono) 38.3 dBf, 45 µV (stereo)
Usable sensitivity		11.2 dBf, 2 µV (IHF)
S/N	Mono	80 dB
	Stereo	74 dB
Harmonic distortion at 1 kHz	Mono	0.3 %
	Stereo	0.5 %
IM distortion	Mono	0.3 %
	Stereo	0.5 %
Separation		45 dB at 1 kHz
Frequency response		30 Hz — 15 kHz $^{+0}_{-2}$ dB
Selectivity		60 dB at 400 kHz
Capture ratio		1.2 dB
AM suppression ratio		54 dB
Image response ratio		70 dB
IF response ratio		70 dB
Spurious response ratio		80 dB
RF intermodulation at 800 kHz		60 dB
Auto tuning threshold	Low	30 dBf
	High	50 dBf

AM tuner section

Frequency range	530 — 1710 kHz (with 10 kHz interval) 531 — 1710 kHz (with 9 kHz interval)
Antenna	Loop antenna
Usable sensitivity	50 dB/m (at 1,000 kHz or 999 kHz)
S/N	54 dB (at 50 mV/m)
Harmonic distortion	0.5% (50 mV/m, 400 Hz)
Selectivity	35 dB (9 kHz), 40 dB (10 kHz)
Auto tuning threshold	55 dB/m

Video section

Inputs	VIDEO 1,2,3: 1 Vp-p 75 ohms
Outputs	VIDEO 1, MONITOR: 1 Vp-p 75 ohms

General

		STR-D3070X	STR-D2070X
System	Tuner section	PLL quartz-locked digital synthesizer system	
	Preamplifier section	Low-noise NF type equalizer	
	Power amplifier section	Pure-complimentary SEPP	
Power requirements		120 V AC,60 Hz	
Power consumption		USA model: 260 watts Canada model: 550 VA	
AC outlets		Two switched, total 120 watts	
Dimensions		430 x 147.5 x 373 mm (17 x 5 $^{7}/_{8}$ x 14 $^{3}/_{4}$ inches)	
Weight		14.5 kg (32 lb)	13.5 kg (29 lb 13 oz)

Supplied accessories
FM ribbon antenna (1)
External antenna connector (1)
AM loop antenna (1)
Remote commander RM-P311 (1)
Sony Batteries SUM-3(NS) (2)

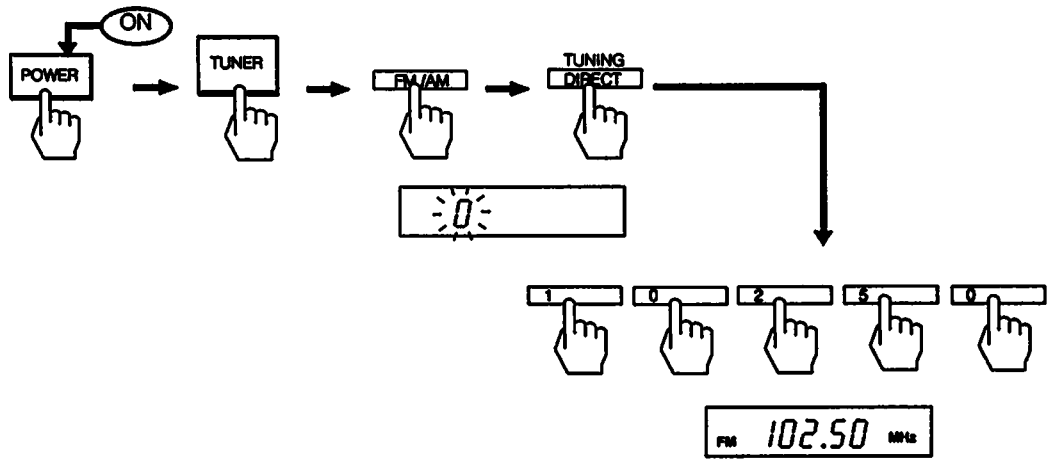
Design and specifications are subject to change without notice.

Quick Reference

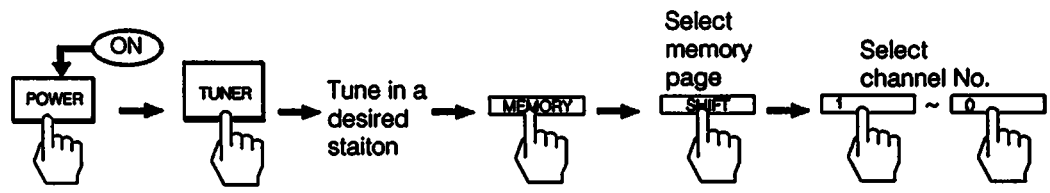
When operate the unit consulting this Quick Reference, make sure that the unit and the various audio/video equipment are properly connected.

Directly tuning in an FM or AM station

Ex. Tuning in the FM station of 102.50 MHz

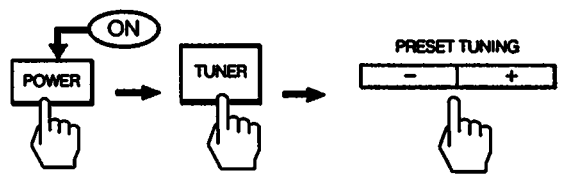


Presetting stations

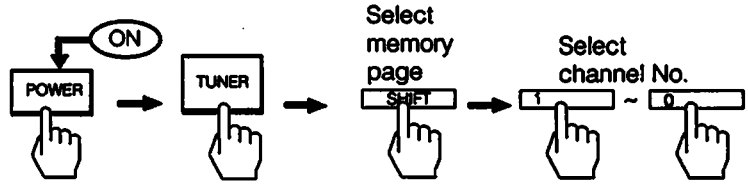


Tuning in a preset station

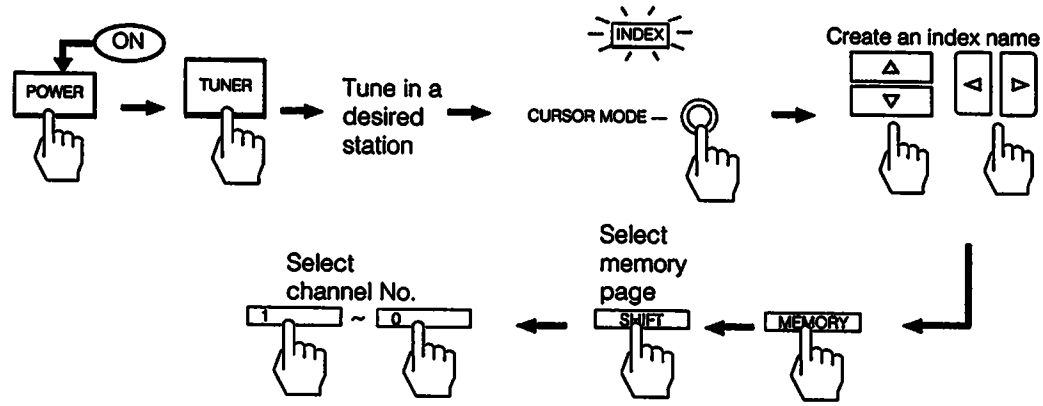
Method A



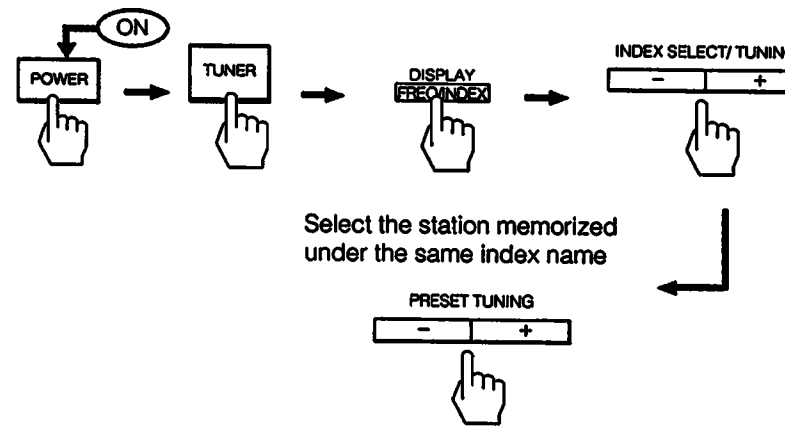
Method B



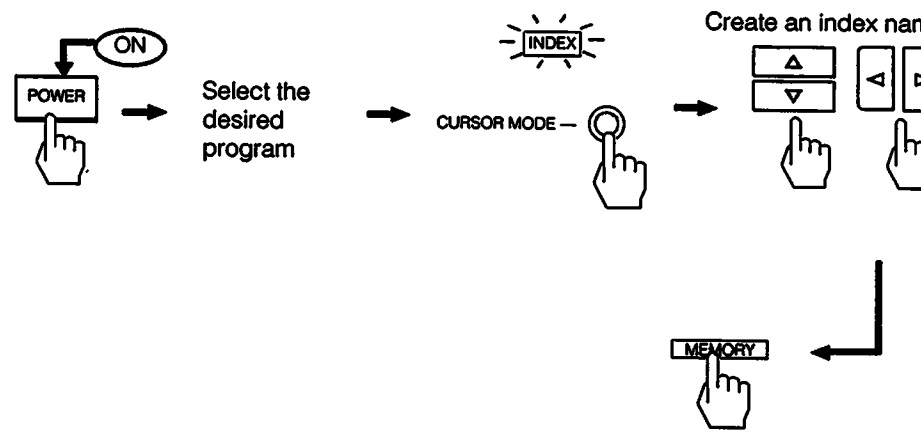
Labeling the preset stations



Selecting a station among the preset stations in the index

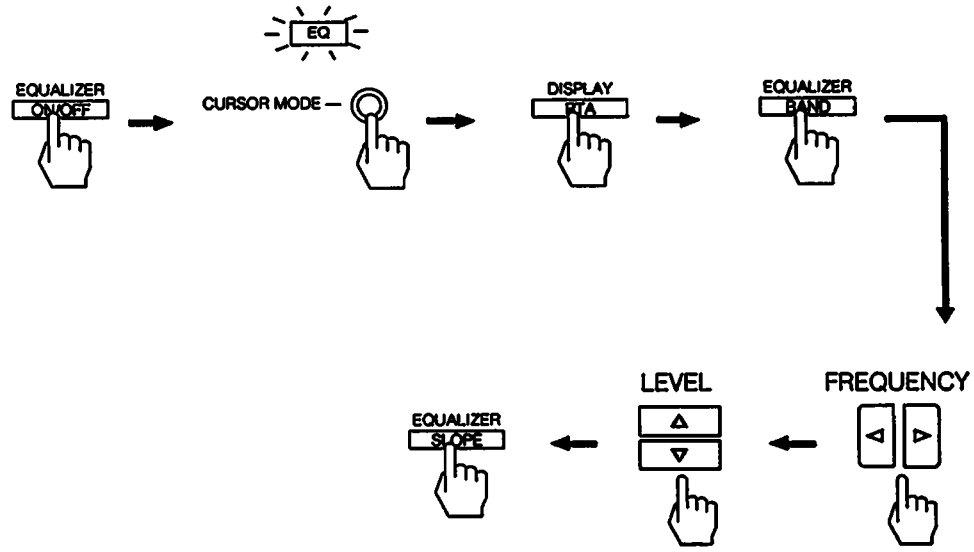


Labeling the program sources

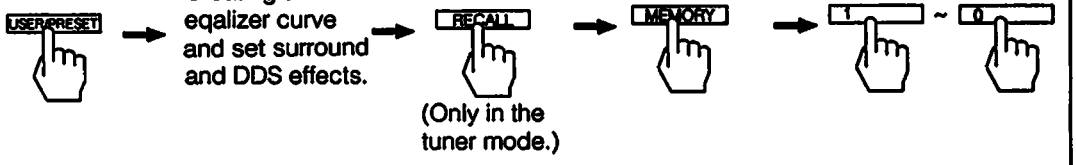


Quick Reference

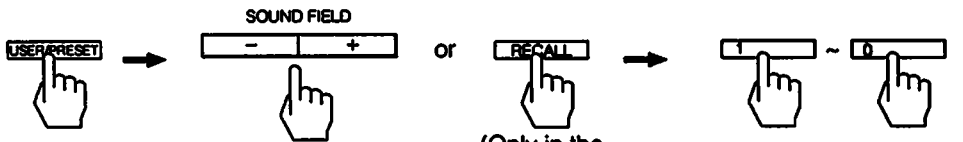
Adjusting the digital parametric equalizer



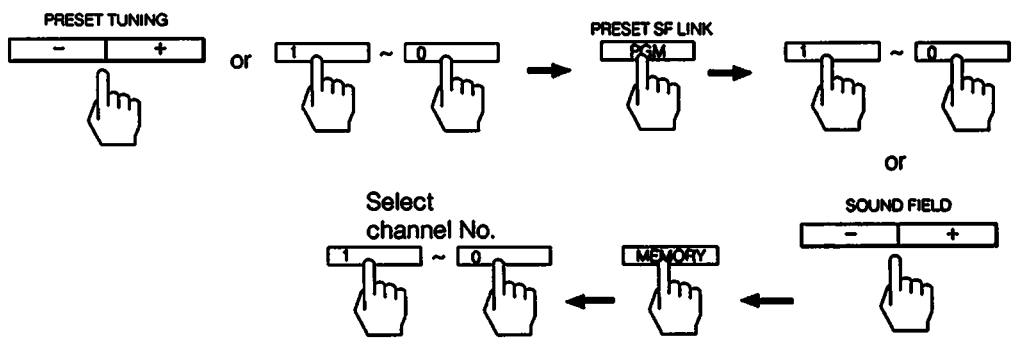
Storing your private setting



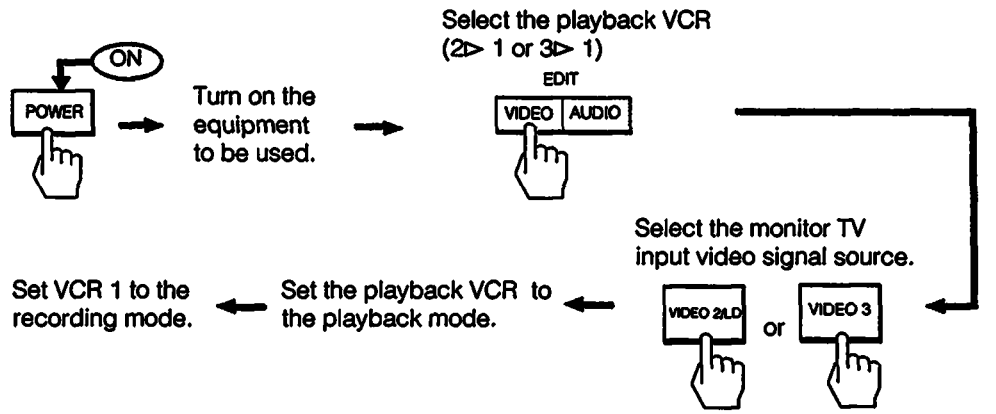
Calling up the sound field setting



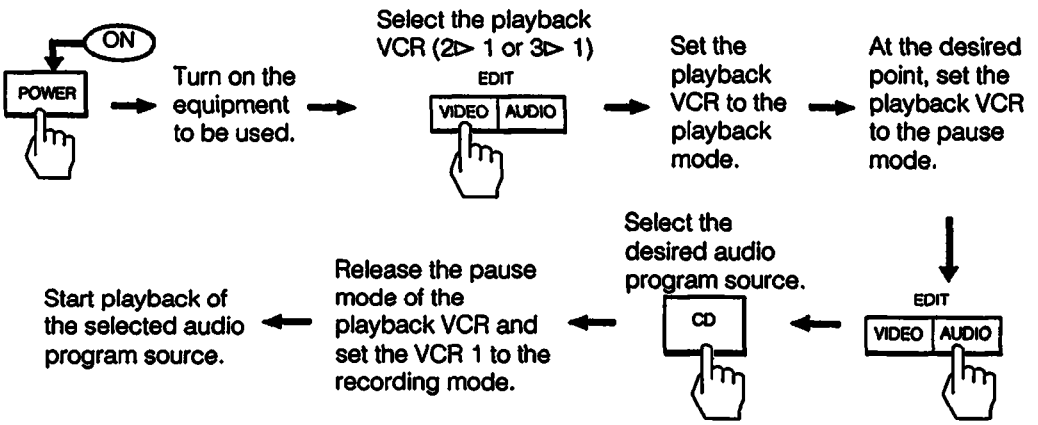
Linking the sound field memory to preset stations



Video tape dubbing



Adding new sound on a video tape during video editing


ON
POWER
Turn on the equipment to be used.
Select the playback VCR (2▷ 1 or 3▷ 1)
EDIT
VIDEO
AUDIO
Set the playback VCR to the playback mode.
At the desired point, set the playback VCR to the pause mode.
EDIT
VIDEO
AUDIO
Select the desired audio program source.
CD
Release the pause mode of the playback VCR and set the VCR 1 to the recording mode.
Start playback of the selected audio program source.